NETWORK WORLD
The Newsweekly of User Networking Strategies
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The keys to success in outsourcing

By Wayne Eckerson
Senior Writer

How well a user negotiates a contract and manages vendor performance can spell the difference between success and failure in an outsourcing deal.

In addition to setting specific parameters for performance, the contract should outline policies and procedures for upgrading or reconfiguring the network. It also has to provide an out — a clear means for handing operations over to an alternative provider if the vendor fails to fulfill its contractual obligations.

But a successful outsourcing project involves more than just drafting an ironclad contract. A user has to build a partnership with the outsourcing firm that goes beyond the typical customer/supplier relationship. Many users describe it as a marriage.

OUTSOURCING
Third in a series

"There has to be a close bonding of the highest level between you and an [outsource vendor],

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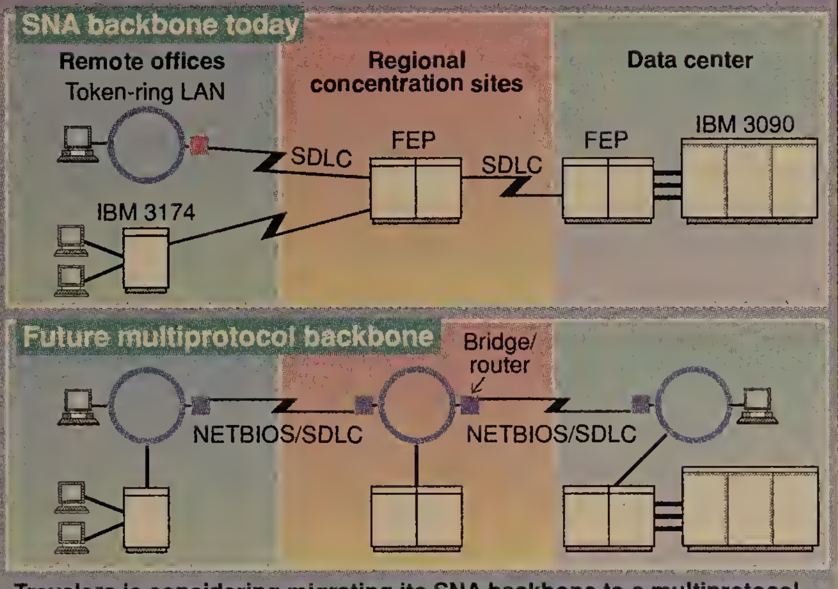
SNA user eyes multiprotocol backbone



Travelers is considering migrating its SNA backbone to a multiprotocol net that would eliminate parallel links and enable the company to more easily integrate different types of network devices.

GRAPHIC BY SUSAN SLATER SOURCE: THE TRAVELERS CORP., HARTFORD, CONN.

Travelers may break with IBM party line on SNA nets

By Tom Smith
New Products Editor

HARTFORD, Conn. — The Travelers Corp. said last week it is considering migrating its SNA backbone network to a local-area internetwork that could support multiple protocols.

The strategy, which is still evolving, represents a fundamental shift in thinking about mainframe network architectures and may portend a radical change in the way large organizations build data nets.

Instead of trying to get everything to conform to IBM's Systems Network Architecture, multiprotocol backbones built on bridge/routers would enable users to add different types of equipment and protocols to a common data utility as necessary.

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GTE/Contel merger shifts power balance

Companies agree to unite in move that would create largest local telco, cellular powerhouse.

By Bob Brown
Senior Editor

STAMFORD, Conn. — GTE Corp. and Contel Corp. last week announced plans to merge in a $6.2 billion stock swap that would create the largest U.S.-based local exchange carrier and the nation's second largest cellular telephone service provider.

The merged company, which would be known as GTE Corp., would support 17.7 million access lines worldwide — more than any regional Bell holding company. Together, the cellular businesses of GTE and Contel would serve areas with a combined population of 50 million, smaller only than the coverage of McCaw Cellular Communications, Inc.

In addition, the combination of GTE Spacenet Corp. and Contel ASC, the companies' very small aperture terminal satellite businesses, would create a more formidable rival for current VSAT market leader Hughes Network Systems, Inc.

The combined local telephone and cellular revenues of the two companies is about $17 billion, analysts said. By comparison, BellSouth Corp., the largest of the RBHCs, had about $14.2 billion in total revenue last year.

By combining their considerable resources, GTE and Contel say they will be better able to fund network upgrades and develop new services, including information services.

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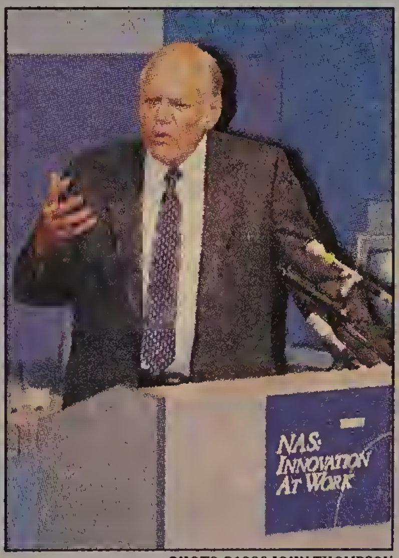

PHOTO ©1990 JOHN THOMPSON
DEC's Ken Olsen

IBM, 3Com work to ease management of local nets

By Susan Breidenbach
West Coast Bureau Chief

NEW YORK — IBM and 3Com Corp. have teamed up to create a specification they say will provide for standards-based management of internetworked token-ring and Ethernet local-area networks from a single management station.

The 3Com and IBM Heterogeneous LAN Management (HLM) specification, which will define an application program interface (API) for net management applications, is based on a subset of the Open Systems Interconnection's emerging Common Management Information Protocol (CMIP) standard.

Although CMIP is designed to manage heterogeneous devices in multivendor OSI networks —

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CHEAP LONG-DISTANCE service can be an exasperating alligator in the swamp. Page 59.

NEWSPAPER

BUYER'S GUIDE

Public net voice mail takes off

By Daniel Briere
and Thomas Walton
Special to Network World

Voice messaging was once a luxury only large companies could afford. But acceptance of the technology has caused costs to fall and usage among smaller firms to rise.

However, while voice-messaging systems have become more affordable, they entail on-site equipment administration, up-front investment and technical know-how — requirements that not all companies are willing or able to deal with. For these firms, a host of public net-based voice-messaging services has sprung up — including offerings from interexchange carriers and regional Bell holding companies that are hoping to capture a portion of the rapidly growing voice-messaging market.

For the RBHCs, voice messaging may be an effective hedge against the increasing

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DEC adds net control tools, partners at DECworld '90

Spells out plans for key EMA component, new Unix net management tools at Boston assembly.

By Jim Brown
Senior Editor

BOSTON — Digital Equipment Corp. held a net management coming-out party here at DECworld '90 last week, using the show to announce a range of new management tools and partners for its network management team, as well as shipment plans for the core component of its Enterprise Management Architecture (EMA).

DEC said Version 1.0 of its VMS-based DEC Management Control Center (DECmcc) Director software, the heart of EMA, will ship in November. The initial version will enable users to manage DEC equipment on DECnet Phase IV and V networks. The more robust DECmcc Director Version 1.1, which will enable users to manage third-party products, will ship next February.

In addition to outlining the functions available in each version of DECmcc Director, DEC announced it will offer enhanced versions of its DECmcc Management Station that will come bundled with DECmcc Director.

The DECmcc Management Station is a DECwindows-based VAX 3100 workstation that currently

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DEC rolls out FDDI wares, holds off on token ring

Offerings include RISC workstation interface.

By Laura DiDio
Senior Editor

BOSTON — As expected, Digital Equipment Corp. used the occasion of its DECworld '90 trade show here last week to introduce its first Fiber Distributed Data Interface products.

DEC's initial offerings for the 100M bit/sec fiber-optic network standard include an FDDI interface for the company's Reduced Instruction Set Computer (RISC) workstation, an FDDI wiring concentrator, an Ethernet-to-FDDI bridge and network management software for managing wide-area FDDI backbone networks.

All of the devices, which are available now, are based on DEC's proprietary FDDI chipset, which the company has licensed to Advanced Micro Devices, Inc. and Motorola, Inc. to resell to other FDDI vendors.

The new DECconcentrator 500 is a hubbing device that can be used to attach up to 12 FDDI devices to a dual-ring, counter-rotating FDDI backbone net. Users can also link remote FDDI devices to a local-area network by using the concentrator to support bridges.

The counter-rotating ring architecture of the backbone provides built-in redundancy in case of network failure, according to Karl Pieper, DEC group manager for FDDI marketing in the Networks and Communications

(continued on page 6)

Users force New York Tel to construct, upgrade nets

By Barton Crockett
Senior Editor

NEW YORK — Responding to pressure from major users, New York Telephone Co. is installing new network facilities and developing new services designed to improve the reliability of its local loop offerings.

Next week, the carrier expects to finalize a five-year contract valued at between $15 million and $20 million to upgrade an existing fiber-optic network to support private data circuits for users in the financial community.

New York Telephone is building on fiber facilities and digital access and cross-connect systems (DACS) installed last year to support private voice circuits among roughly two dozen members of the Securities Industry Association (SIA), a trade group of the country's largest investment firms. Approximately 50 more firms are in the process of adding voice traffic to that network.

The contract will be for about 5,000 56K bit/sec circuits that will carry data traffic.

Within the next several months, New York Telephone plans to tariff a service under which users can obtain redundant switched and private lines. Customers will be able to purchase separate physical facilities, running to different central offices,

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Briefs

NIST backs public key encryption. The National Institute of Standards and Technology (NIST) said last week it plans to release a standard for public-key encryption in September.

Public-key encryption systems help solve the problem of distributing keys needed to decrypt messages by using dual keys — one can be published publicly and the other is kept secret. Messages are encrypted using the public keys of the intended recipient and can only be decrypted with the secret key. Although there is no public-key standard today, RSA Data Security, Inc.'s product has become a de facto standard, backed by the likes of Digital Equipment Corp., Lotus Devlopment Corp., Motorola, Inc., Novell, Inc., Racal-Milgo and others.

Sayonara. Fujitsu America, Inc. is withdrawing from the U.S. modem and data service unit (DSU) market, according to a letter sent to Fujitsu distributors last week by L.R. Hinton, director of sales for Fujitsu's data communications division.

The move throws into question not only support for current users, but also the status of the insurance policy Fujitsu touted for its modems and DSUs. That policy states that if a Fujitsu modem or DSU fails within one year, the company will both fix the device and give the user another one free. Fujitsu officials declined to answer questions regarding the matter.

SABRE looks to VSATs. SABRE Computer Services, a division of American Airlines, Inc., last week said it will install 1,000 to 2,000 very small aperture terminal satellite earth stations to link travel agencies to American's Tulsa, Okla., data center. Travel agencies to be served will be in locations that do not generate enough traffic to warrant a node on AAnet, an X.25 packet network the company plans to begin installing in the fourth quarter. The VSAT links are intended to be more reliable and cost less than the leased lines they will replace.

Buying friends. Sears Communications Co. last week said it will provide free electronic data interchange software and training to entice 5,000 firms to join Sears Merchandise Group's EDI program. The products will let participants generate electronic invoices, advanced shipment notices and purchase order receipts in a Sears, Roebuck and Co. EDI format based on standards set by the Uniform Code Council, Inc.'s Voluntary Interindustry Communication Standards (VICS) committee.

AT&T forms messaging unit. Gordon Bridge, president of AT&T Computer Systems, was named president of a new AT&T business unit that will include assets acquired from Western Union Corp.'s Business Services Group, including the EasyLink electronic messaging business. The new unit, which will also include AT&T's existing electronic mail and electronic data interchange services, has yet to be named.

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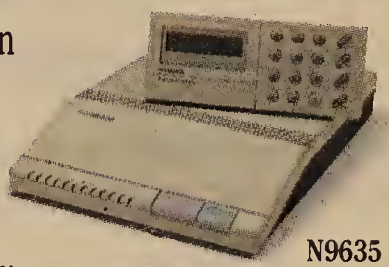

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See The FAXNet Form on Page #18

Banyan offers new VINES version for 486-based PCs

Promises major boost in applications processing.

By Laura DiDio
Senior Editor

WESTBOROUGH, Mass. — Banyan Systems, Inc. last week announced a version of its VINES 4.0 network operating system optimized for Intel Corp. 80486-based personal computers.

Dubbed VINES for 486 Platforms, the new software enables CPU-intensive client/server applications to run twice as fast on 80486 personal computers as they currently do on 80386 computers, according to Barry Burke, Banyan manager of software product marketing.

This performance improvement is especially beneficial to customers who are using their VINES networks for compute-intensive, server-based network services. These services include VINES network mail, VINES 3270/SNA gateway, high-speed local- and wide-area network bridging and data base applications such as Oracle Corp.'s Oracle Server for VINES.

"In a LAN server environment, faster processing speeds translate into the ability to support more server-based applications on the network server while providing faster response times," Burke said. "The VINES for 486 Platforms will also enable the server to support a greater number of users without any performance degradation."

Burke said he couldn't say how many additional workstations VINES for 486 servers will support over the current VINES 80386 software. "It's dependent on the application," he said.

"Users who are only employing their servers for basic file and print services may be able to support hundreds more PCs on a single VINES for 486 Platforms server than those using the VINES 386 software, while a user who is doing transaction processing on the 486 server may be able to comfortably attach 50% more workstations to the server [than a VINES 386 server]," Burke said.

VINES for 486 Platforms is fully interoperable with all previous versions of VINES. In addition, all applications that currently run in the VINES environment are fully compatible and interoperable with the new 80486 version of VINES.

Compaq Computer Corp.'s DeskPro 486/25 Models 120, 320 and 650 are the first 486-based personal computers to be certified to run VINES for 486. Banyan expects to certify several more systems beginning next month, Burke said. He declined to divulge company names.

VINES for 486 Platforms is available now and costs $7,490. VINES for 386 Platforms users can upgrade to the 80486 version for $1,495, which represents the difference between the cost of VINES 386 and the price for the latest 80486 version.

FCC won't fight appeals court Computer III ruling

Sikes says agency won't ask California court to review ruling overturning Third Computer Inquiry.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Federal Communications Commission Chairman Alfred Sikes said last week that the agency will not ask a California appeals court to reconsider its ruling last month that overturned the FCC's Third Computer Inquiry.

In order to ensure that Open Network Architecture (ONA), a key component of Computer III, is not derailed, Sikes said the FCC will forgo asking the court to reconsider its decision. Instead, the agency will accept the court's ruling calling for it to hold new proceedings to decide how enhanced services should be regulated.

In June, the U.S. Appeals Court for the Ninth Circuit said the FCC acted capriciously in 1986 when it eliminated its requirement that the regional Bell holding companies offer enhanced services through separate subsidiaries. The court said the FCC failed to compile adequate evidence to support the rule change.

Now the FCC will open a proceeding to determine whether it can collect enough evidence to justify the Computer III rule change. The FCC will also open a proceeding to examine whether the court's decision prevents the agency from implementing other aspects of ONA.

Sikes did not rule out the possibility of challenging the court ruling to the U.S. Supreme Court level. The deadline for filing such a petition is Sept. 4. A broad-based coalition of users and vendor groups recently made such a challenge (see "Coalition asks Supreme Court to reverse C3 ruling," page 9).

> The appeals court has plunged the industry into confusion over the future of ONA.
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By overturning and sending the Computer III decision back to the FCC for further consideration, the appeals court has plunged the industry into confusion over the future of ONA — regulations that spell out the steps the RBHCs must take to open their networks to competing enhanced service providers.

It is unclear whether the introduction of ONA services will be stalled, how far the FCC can go in regulating intrastate matters and whether the RBHCs will have to spin off separate subsidiaries to offer enhanced services they currently offer through their telephone company units.

Sikes said the ONA specifications requiring the RBHCs to open their nets to rival providers and sell transmission services on an unbundled basis is still valid. The only question is whether the FCC can collect enough evidence to justify the second part of ONA — allowing the RBHCs to offer enhanced services through their telephone units.

"It is not crystal clear that ONA is [nullified] by the Ninth Circuit's decision," Sikes said. "We don't want to leave any confusion with respect to ONA."

Sikes said his primary objective is to minimize possible disruption of the ONA process or enhanced services currently being provided by the RBHCs. Six of the RBHCs have received special permission to offer some enhanced services through their telephone units. That creates an awkward legal situation for the RBHCs since the court ruling reinstitutes the requirement for separate business units.

It is possible that through the proceedings, the FCC will gather enough evidence to justify eliminating the separate subsidiary requirement. In that case, it could issue rules very similar to those it issued in Computer III.

In addition to the public proceedings, the FCC is evaluating a joint petition filed by the RBHCs, asking that they be allowed to continue offering enhanced services through their telephone units until the legal questions about Computer III have been resolved.

Ex-Lotus exec Kapor forms users rights organization

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Mitchell Kapor, president of ON Technology, Inc. and founder of Lotus Development Corp., last week announced the establishment of The Electronic Frontier Foundation to preserve the civil liberties of users.

Kapor said recent actions by the Secret Service against alleged computer hackers had convinced him that law enforcement agencies were violating individuals' legal rights.

Kapor blamed public ignorance about the electronic medium for what he called law enforcement breaches of the First Amendment, which protects freedom of expression. The foundation, Kapor emphasized, will seek to educate the public and private sector about social issues in computer communications.

The foundation has been started with unspecified six-figure contributions from Kapor and Steve Wozniak, a cofounder of Apple Computer, Inc.

On hand with Kapor at the announcement of the foundation was Steve Jackson, head of Austin, Texas-based Steve Jackson Games, whose equipment was confiscated by the Secret Service last March because Jackson published a handbook that the Secret Service believes promotes computer crime.

Jackson has not been charged with any offense because his firm was raided by the Secret Service with a sealed warrant. A sealed warrant was given out by a judge based on sworn testimony by the Secret Service about the case.

Kapor's foundation is paying for Jackson's legal expenses in the case. Lawyers for Jackson said the case represents a violation of the Fifth Amendment, which forbids deprivation of property without due process of law.

"This is not a hacker defense fund," emphasized John Barlow, Kapor's associate in the foundation.

The foundation wants to look at issues such as the question of whether an electronic bulletin board owner is responsible for all the material that goes on it. According to Barlow, if the bulletin board is judged to be a public forum, users should be accorded freedom of expression.

"It's absolutely mandatory that the First Amendment applies to digital communications," Barlow said.

The foundation's mission is to provide "public education so we can make a set of rational choices," Kapor said.

"The bottom line is that these new digital media should at a minimum be accorded the traditional rights of other media," Kapor said. "It's important to intervene now because precedents are being set."

FCC takes action to lower international calling rates

Seeks to force foreign carriers to reduce prices.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Claiming U.S. customers are being overcharged for international calls by as much as 50%, the Federal Communications Commission took steps last week to bring down the cost of foreign calls.

The FCC announced it is opening a formal proceeding examining ways in which it can help U.S. carriers negotiate lower rates for completing calls overseas. One of the ideas under consideration is to reward foreign countries that agree to lower international rates by cutting the red tape they go through to get FCC approval on rate changes.

The FCC is also examining how it can use its regulatory authority to mandate lower international rates with countries that resist lowering prices in negotiations with U.S. carriers.

Currently, individual carriers in each country negotiate international prices, referred to as accounting rates, based on guidelines from the Consultative Committee on International Telephony and Telegraphy. Although the CCITT urge carriers to base prices on the cost of providing service, FCC Chairman Alfred Sikes last week said that international rates may be priced as much as 50% above cost.

U.S. carriers, including AT&T, agree that rates are inflated but say there is little they can do if foreign carriers refuse to lower them. Although AT&T has been able to negotiate lower accounting rates in 1989 and 1990, the carrier says they are not low enough and applauded the FCC's actions.

"This strong action by the FCC . . . will help all U.S. carriers in the effort to lower the accounting rates to more accurately reflect costs," AT&T said in a statement last week.

(continued on page 55)

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See The FAXNet Form on Page #18

DEC considers more NetWare LAN support

BOSTON — Digital Equipment Corp. President and Chairman Ken Olsen said at the DECworld '90 trade show here last week that DEC is holding discussions with Novell, Inc. on expanding support for NetWare local-area networks within DECnet.

"The relationship [with Novell] isn't quite worked out yet, although I think both companies would like to see increased support for NetWare LANs within the DECnet environment," said Olsen, who declined to reveal specifically what options the companies are exploring.

Novell currently offers NetWare for VMS, which enables a VAX to act as a server for a NetWare LAN. But users on the network cannot easily access other resources on a DECnet network and have no way to access DEC's All-In-1 office software.

NetWare users can only access VAX applications via terminal emulation, explained Robert Davis, director of product marketing in Novell's San Jose, Calif., development center. He said DECnet support for NetWare "is certainly not as elegant or as comprehensive as it could be."

Enhanced NetWare support would be something of a midstream strategy switch for DEC, which is one of the largest OEM suppliers of Microsoft Corp.'s OS/2 LAN Manager. DEC is one of about 35 vendors that resells value-added versions of LAN Manager to users through direct sales and distribution channels.

Until now, DEC's only acknowledgement of the Novell camp has been a year-old agreement under which DEC provides service and support for NetWare LANs that are installed at DEC VAX sites.

But the large installed base of NetWare LANs, coupled with the slow acceptance of LAN Manager, is apparently pushing DEC and Novell closer together. While Olsen emphasized he was not making any strategic alliance or product announcements regarding NetWare, he had nothing but laudatory words for Novell.

"I'm not quite sure just what we'll do. And I'm not making any announcements, but we offer many wide-area network services that Novell is lacking," he said.

Olsen played up the fact that the differences in the two firms' networking strategies actually make them good potential partners.

"Digital does what Novell doesn't do, and vice versa," Olsen said. "Novell doesn't do wide-area networking and tie large mixed networks together, and that's one of the things Digital does best."

"NetWare is designed for PC-oriented users; it's an elegant, simple solution, and users love it," he said. "What Digital has to offer is more complex because our networks are more complex. We complement each other perfectly."

— Laura DiDio

DEC roles out FDDI, holds on token ring

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group. In the event of a failure on the primary ring, the traffic switches to the secondary or backup ring.

The DECconcentrator 500, which is priced at $15,000, also features resident network diagnostic software to test the FDDI backbone when the network is first booted.

DEC's second FDDI offering, the DECbridge 500, is a self-learning bridge that links a single thin- or thick-wire Ethernet to a 100M bit/sec FDDI backbone net.

The DECbridge 500 connects to an FDDI LAN via a DECconcentrator 500. The bridge is a single-attachment station, meaning it only connects to the primary FDDI ring, according to Wendy Michael, DEC's FDDI product marketing manager. Linking it through a DECconcentrator 500 safeguards the link against failure.

> The DECbridge 500 is a single-attachment station, meaning it only connects to the primary FDDI ring, according to Michael.

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"The dual-attachment station and network management capabilities of the DECconcentrator provide users with built-in redundancy in case of failure and enable network administrators to add and delete FDDI devices as needed without disrupting network operations," Michael said. "This wouldn't be possible if the DECbridge 500 directly linked Ethernets to FDDI backbones."

The device, which costs $25,000, uses

The IBM RISC System/

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the Spanning Tree Algorithm to automatically map the most efficient data path across the network.

CPU interfaces

DEC also introduced the FDDIcontroller 700, an interface for the DECstation 5000 Model 200 RISC workstation. Pieper said the adapter is half the size and, at $6,000, half the price of competing interfaces. The FDDIcontroller 700 adapters are expected to ship this fall.

The company said it is developing FDDI adapters for its VAX 6000 and VAX 9000 series minicomputers that it will deliver sometime in 1991, although pricing and availability have not yet been set.

Michael said DEC does not feel compelled to announce FDDI interfaces for its VAXes "since most of the current demand is for FDDI adapters for RISC-based workstations."

FDDI catching on slowly

Analysts present at the announcement gave DEC high marks for the breadth of the products as well as the competitive pricing, but noted that demand for FDDI products is still low.

According to Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C., "Even though DEC is offering an aggressively priced FDDI product portfolio — the $6,000 tag on its FDDIcontroller 700 is the best in the industry — I don't see a high volume of users migrating to FDDI until the cost per connection goes below $3,000."

While FDDI took center stage at DECworld, analysts and users at the show were left wondering how long DEC will keep its token-ring products waiting in the wings.

The company decided at the last minute not to go ahead with the planned introduction of token-ring products because it could not firm up delivery dates for the devices, according to Gail Daniels, DEC's LAN product market manager.

"There's no problem with the technology. We're testing the products now," Daniels said. "We chose not to introduce token-ring at DECworld because we don't have firm delivery dates, but we are committed to supporting the technology and expect to make an announcement sometime in the fall." ◘

Users force New York Tel to upgrade nets

continued from page 2

to carry private-line and switched traffic.

New York Telephone is offering the tariff in response to demands from the New York Automated Clearinghouse Association, the SIA and the Wall Street Telecommunications Association, according to carrier officials.

"There's no doubt that what is going on is a fundamental change in the way we deploy local loop services to some customers," said Peter Renner, director of data communication services for White Plains, N.Y.-based Nynex Service Co.

New York Telephone is undertaking these efforts to improve redundancy and disaster recovery capabilities in the local loop. For example, the SIA fiber net will enable investment firms to reroute critical trading data around downed lines and to bypass outages in local carrier facilities.

New York Telephone will supply users purchasing more than 10 56K bit/sec local loop circuits with channel banks from Newbridge Networks, Inc., through which lines will be routed to one of the four DACSs interconnected by a ring-and-mesh fiber network.

The fiber network will provide automatic alternate path routing to enable users to bypass problems in the carrier's network.

Some user locations, such as the data processing facilities of the New York and American stock exchanges, will have dedicated access to at least two DACSs. If one link fails, the other would be able to handle all incoming and outgoing traffic.

According to Timothy Downey, staff director of data applications for New York Telephone, another advantage of the network is that user and carrier employees will be using the same Newbridge network management system.

"One of the biggest difficulties in fixing errors is that the user and the carrier are usually seeing different things," Downey said. "With this arrangement, we'll eliminate that problem."

Customers using the SIA net for voice communications said they have already noticed an improvement in network uptime. "We used to have 1% of our lines out all the time, and with this network, we haven't had an outage yet," said an SIA network user who requested anonymity.

A New York Telephone spokesman said that users participating in the data communications contract could expect savings of 15% to 20% on data circuits provided over the network as a result of volume discounts.

According to Alyce Wittus, staff director of data applications for Nynex Service, the primary benefit of the new tariff for redundant facilities is that it will reduce the cost to users of installing backup local loop links.

Currently, users can obtain redundant facilities only by entering into a custom contract with a carrier, which is prohibitively expensive. Offering this service under a general tariff will spread the cost of building redundant facilities across a large base of users, reducing charges to individual organizations.

Wittus said that by year end, New York Telephone also plans to cut over a service that will enable users to have one-half of their incoming switched voice traffic routed through one central office and the other half routed through a second central office. This will minimize the impact of an outage at any single central office. ◘

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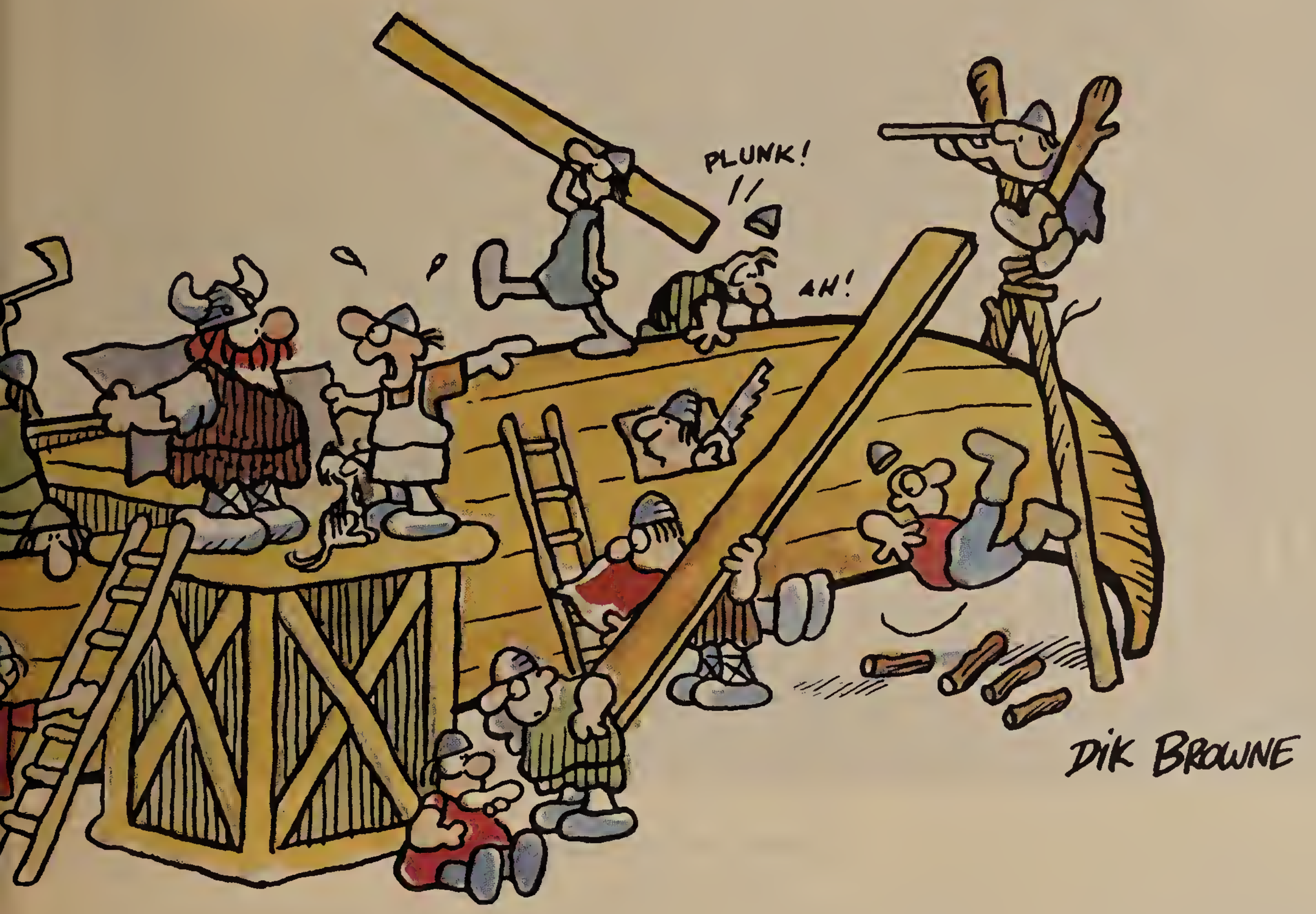

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See The FAXNet Form on Page #18

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

Novell, Inc. incurred $400,000 in expenses related to its failed "merger of equals" with Lotus Development Corp. during the second quarter, ended April 28, according to a quarterly report from the company. Novell expects to report additional, smaller merger costs during its third fiscal quarter.

People & Positions

John Barry last week resigned as president and chief operating officer of **Systems Center, Inc.**, a Reston, Va., computer software firm.

Robert Cook, the company's chairman and chief executive officer, will assume Barry's duties. No announcement has been made as to whether Cook will take on these duties permanently.

According to a company spokeswoman, Cook, who previously was expected to step down, now wants to remain CEO awhile longer, given Systems Center's acquisition of the popular Net/Master integrated network management system from Cincom Systems, Inc. earlier this year.

Banyan Systems, Inc. announced the promotions of **Rodger Weismann** to the newly created position of executive vice-president and chief operating officer and of **James Allchin** to senior vice-president.

Previously, Weismann was the company's chief financial officer and was responsible for Banyan's hardware products group.

Allchin had previously served as the company's chief technical officer, a position that is not expected to be filled.

History of the AT&T Consent Decree

Jan. 1982	AT&T and Department of Justice announce they have agreed to settle antitrust suit by divesting local Bell companies.
Aug. 1982	U.S. District Court Judge Harold Greene approves modified version of Consent Decree known as the Modified Final Judgment.
Jan. 1984	MFJ takes effect.
Sept. 1987	First triennial review of the MFJ. Greene keeps bans on manufacturing and long distance intact; modifies information services restriction to allow transmission, but not content generation; frees Bells to enter nontelecommunications businesses.
Dec. 1987	Greene issues clarification of triennial review ruling that manufacturing includes research and development in addition to fabrication; says manufacturing ban applies to software, too.
March 1988	Greene issues clarification of information services ban – allowing Bell companies to provide electronic mail, gateways and voice store-and-forward services.
April 1990	Appeals court says Greene used wrong legal standard to evaluate information services ban; sends case back to him to reconsider.
June 1990	Fifteen parties petition U.S. Supreme Court asking for appeals court decision to be overturned.

GRAPHIC BY SUSAN SLATER SOURCE: *NETWORK WORLD*

Coalition asks Supreme Court to reverse C3 ruling

Users, others unite to fight appeals court decision.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — A broad-based coalition has asked the U.S. Supreme Court to overturn an appeals court ruling concluding that U.S. District Court Judge Harold Greene erred legally when he decided to continue to ban the RBHCs from providing information services.

The group's members include the Ad Hoc Telecommunications Users Committee, the Consumer Federation of America, the Enhanced Services Council, the Independent Data Communications Manufacturers Association, Inc. (IDCMA), the Maryland People's Council, MCI Communications Corp. and the Ohio Consumers' Council.

Several of the 15 members, including MCI and IDCMA, tried unsuccessfully to have the U.S. Court of Appeals ruling put on hold until the Supreme Court decides whether to hear the case.

The appeals court decision in question, which was issued in April, stated that Greene should have used a less stringent legal standard in evaluating regional Bell holding company requests to offer information services. The court sent the case back to Greene for reconsideration.

In its filing, the coalition stated, "The Court of Appeals erred on replacing express language in the AT&T Consent Decree with its own flexible test for removal of critical, pro-competitive restrictions on the business activities of the telephone company monopolies."

This "ruling threatens to dislocate coherent enforcement of competitive protections that affect the lives of most Americans, as well as billions of dollars of annual investment in 'a vast and crucial sector of the economy.' "

In its petition, the group stated that there are grounds for the Supreme Court to hear the case because the appeals court may have been meddling in areas where it should not have been when it rejected Greene's criteria for evaluating modifications to the Consent Decree.

Until now, Greene has rejected RBHC attempts to enter new businesses as long as there was a substantial possibility they could use control of the local network to impede competition. However, the appeals court said Greene should only prevent the RBHCs from entering information services if it is certain the companies will act anticompetitively.

The coalition also claims that the appeals court ignored legal precedent by refusing to defer to Greene's interpretation of the Consent Decree. The group argues that because Greene was responsible for negotiating the document, he is in a unique position to understand its provisions.

In other instances, where language appears ambiguous, appeals courts have deferred to the judge responsible for the consent decree in question.

The appeals court upheld Greene's decision to continue the ban on manufacturing and long distance but said he would have to tighten the scope of his decisions in those areas in future rulings.

In deciding to maintain those bans, Greene had considered whether the RBHCs were likely to cross-subsidize such ventures and thereby harm telephone ratepayers. The appeals court said

(continued on page 10)

Video links limited by lack of bridges

AT&T, US Sprint videoconferencing services lack adequate intercarrier conference facilities.

By Ellen Messmer
Washington Correspondent

AT&T and US Sprint Communications Co. are aggressively moving to enhance their reserved-bandwidth videoconferencing services with an eye toward market expansion.

But one factor that may limit acceptance of the services is that customers can only conference with users served by the same carrier, unless they are willing to foot the bill for routing calls through a bridge in New York.

AT&T's Accunet Reserved Digital Service and US Sprint's Meeting Channel are the only two long-distance reservation-based videoconferencing services currently offered in the U.S.

To establish a videoconference, a customer notifies the carrier in advance to set up the call. AT&T or US Sprint then issues computer instructions to reserve bandwidth on common-use private lines set aside by the carriers for videoconferencing. At the prearranged time, the videoconference is established.

Although intracompany connections can be made as needed since the carriers support links among their own customers, users are beginning to discover that setting up videoconference calls with companies that use a different service can become costly. The primary stumbling block is that there is only one videoconferencing gateway between the AT&T and US Sprint networks.

The gateway, located in New York and paid for by US Sprint, serves as a connection point between the networks. All videoconferencing traffic, regardless of where it originates, must be routed through New York for a US Sprint/AT&T connection. Customers are billed for the extra long-distance charges.

US Sprint installed the link five years ago when it purchased dedicated T-1 access to AT&T Accunet Reserved Service in New York, thus providing an access point for its customers.

"The customer doesn't realize who's paying for those interconnection fees," said Holly Owens, the Meeting Channel's director of teleconferencing. She said that US Sprint absorbs the access

(continued on page 10)

INDUSTRY BRIEFS

AT&T last week said it plans to eliminate 4,300 jobs from its Network Services Division, the company's long-distance arm.

Most of the job cuts involve technical and maintenance positions, but an AT&T spokesman said a few hundred managers' jobs will be eliminated as well. The work force reductions, part of a cost-cutting measure, are possible because of office closings and technical advances in the net that have reduced the need for employees, an AT&T spokesman said.

Long-distance customers should see little difference in their service as a result of the job cuts, the spokesman said, with the possible exception of having to deal with a service representative in a different geographical area. Still, customers' network problems will most likely be taken care of remotely, he said.

Employees will be offered pension sweeteners as early retirement incentives, as well as the opportunity to move into 2,200 job vacancies in the Network Services Division before AT&T is forced to resort to mandatory layoffs. AT&T will know by fall how many employees will have to be laid off, the spokesman said.

Some 1,600 employees have already agreed to leave the Network Services Division, which currently employs about 31,000 people.

Both **Digital Equipment Corp.** and **Sun Microsystems, Inc.** last week said they have agreed to license **Legato Systems, Inc.**'s Prestoserve file system accelerator hardware/software product.

(continued on page 10)

Video links limited by lack of bridges

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charge cost, though the customer still has to bear the cost of transport to New York.

By paying access charges to AT&T, US Sprint is subsidizing AT&T's ability to provide interconnection for AT&T videoconferencing customers. According to Jim Posko, AT&T product marketing manager, AT&T's videoconference calls are rarely established with US Sprint's Meeting Channel, and AT&T doesn't promote the interconnection capability.

Peter Grimard, product manager for Accunet Switched 384 Service, a new AT&T offering also to be available later this year, said he does not think AT&T has much to gain with interconnection. "I don't see a substantial benefit to AT&T, but I do see an advantage to our competitors," he said.

US Sprint, on the other hand, said it sees the gateway as a prime attraction to draw traffic to the Meeting Channel. Owens called the connectivity issue "a big priority. We've won a lot of customers because we've gone out of our way to put in a gateway," she said.

AT&T, on the other hand, has a less sanguine view of the interconnectivity issue. "We're not turning the blind eye to gateways," said Daniel Morris, AT&T's product manager for videoconferencing. "We're interested in providing services for our customers, but it's a matter of priorities."

At a customer's request, AT&T will set up a videoconference connection over the US Sprint gateway.

At this point, however, Morris said AT&T is more interested in rolling out a new line of services, such as the AT&T Global Video Gateway, which is scheduled to be available later this year. That service will enable videoconferencing users to set up calls with sites that use disparate videoconferencing equipment.

Global Video Gateway will handle coder/decoder (codec) format conversions and automatically adjust data to the different transmission speeds used between any two sites. It will also establish videoconferences between users of AT&T's Accunet Reserved Digital Service and Accunet Switched Digital Service.

Eliot Gold, president of Telespan Publishing Corp., which follows the videoconferencing market, concurred with AT&T, saying US Sprint has more to gain. He called US Sprint's strategy of providing access a key factor in its success.

"AT&T was the dominant force years ago, and they let US Sprint take over with a clever strategy of giving everyone access to the Meeting Channel," Gold said. "US Sprint promised access, and it worked. The market is now more balanced between the two than US Sprint ever imagined."

Gold predicted that the carriers will eventually establish a gateway system as videoconferencing users demand better service and as they increase the amount of off-net videoconferences. But it's not going to happen until after 1990, when AT&T unveils its services, he said. ⊡

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Coalition asks court to reverse C3 ruling

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Greene should consider only whether RBHC entry into those areas would drive out or preclude competition.

Although the 15-member coalition said it is optimistic the Supreme Court will hear its case, several attorneys last week said the battle will be all uphill. Regardless of the merits of any given case, the Supreme Court can hear only 175 of the roughly 5,000 requests for review each year.

"I don't know anybody who really thinks they have a chance," said one telecommunications attorney. "But who knows, there may be a justice who is persuaded that this is a significant issue because of its impact on the communications industry and on international competitiveness."

In deciding whether to hear a case, the Supreme Court generally looks at criteria such as the public importance of the issue, the possibility that a lower court erred legally or whether decisions from different appeals courts conflict.

Telecommunications attorneys generally agree that the appeals court decision will make it easier for the RBHCs to have the information services ban lifted, but that outcome is far from guaranteed at this time.

While the coalition waits to see if the Supreme Court will hear the case, Greene is going forward with the appeals court order to review the information services restriction. He has set up a schedule from August until November for parties to file briefs. After that time, Greene has indicated he may want to expand his inquiry to include testimony from witnesses. ⊡

Industry Briefs

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The license will allow DEC to provide enhanced disk I/O speed and throughput for its RISC/Unix DECsystems that are used as file and data base servers. DEC will include Prestoserve as part of these servers.

Sun is planning to provide Prestoserve as an option to its high-end servers under the name of Sun Prestoserve and will incorporate Prestoserve into its future server products.

Prestoserve will speed up the transfer of files based on Sun's Network File System protocol, enabling heavily loaded file servers to support many additional clients and offer better response times to existing clients. ⊡

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

As a condition of the sale of parts of its national network, the Argentine government is asking the new owners to increase the percentage of local calls completed without difficulties from 49% now to 85% by 1996. Completion rates for long-distance calls between urban areas are supposed to rise from 23% now to 80% by that same year.

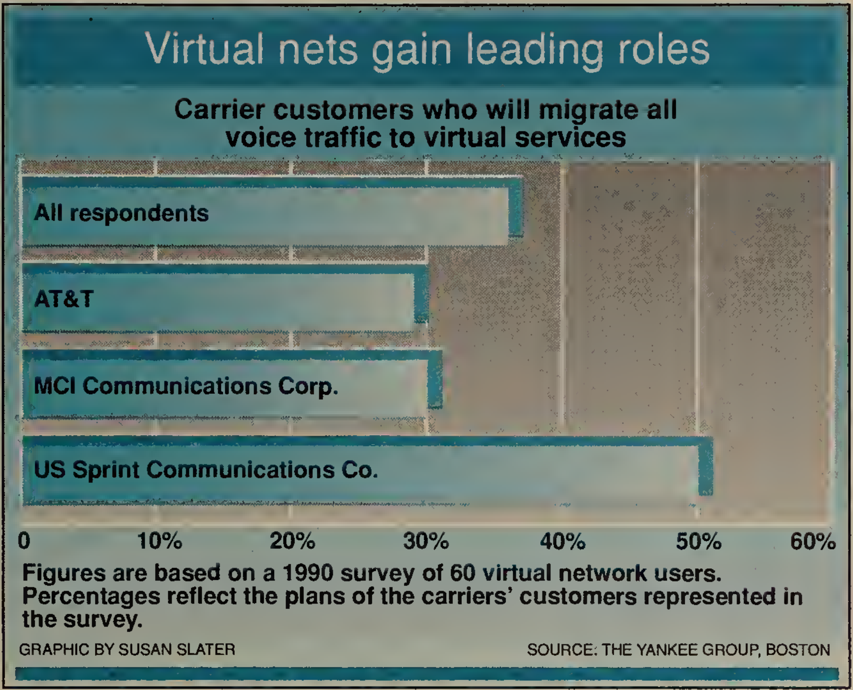
Carrier Watch

Nynex Corp. recently signed a $5 million contract with Integrated Network Corp. (INC) for central office and customer premises equipment to be used to build an all-digital network for the Massachusetts State Lottery.

The network, based on INC's Universal Data Voice Multiplexer (UDVM) system, will support more than 5,300 lottery ticket agents throughout the state. The UDVM equipment to be installed includes a small device used to tie lottery terminals to existing two-wire local access lines.

Microwave-based alternate carrier **Local Area Telecommunications, Inc.** recently said it has filed an experimental license request with the Federal Communications Commission seeking permission to test a personal communications network (PCN) service in New York.

The PCN test would involve operation of a second-generation cellular mobile radio system. In the test, thousands of New Yorkers would carry lightweight, wireless phones, which would connect to the local telephone net through the carrier's radio-based microcell stations positioned in streets and buildings.



Figures are based on a 1990 survey of 60 virtual network users. Percentages reflect the plans of the carriers' customers represented in the survey.

GRAPHIC BY SUSAN SLATER

SOURCE: THE YANKEE GROUP, BOSTON

How-to tips for installing a voice processing system

As the options have multiplied, so have the snags.

By Tom Fermazin
Special to Network World

A decade ago when voice processing was still in its infancy, systems were much simpler. The majority of installed systems allowed users to call another mailbox and leave a message or call their own mailbox and get messages.

That was voice processing in the early 1980s. Today, voice processing is infinitely more complex, with features such as Automated Attendant, Audiotex and Interactive Voice Response all available within the same system. If you're puzzled by the prospect of installing a voice processing system, the following are some suggestions to ponder.

> Management must endorse voice processing emphatically, continually and visibly.

▲▲▲

■ **Don't plan in a vacuum.** "Implementing a voice processing system is a team sport," said Don Van Doran, president of Vanguard Communications Corp., a Morris Plains, N.J., consulting firm specializing in voice processing applications. "Get everyone on your team in the beginning or plan to face them on the opposing team when the new system cuts over."

Communication will bring cooperation, which ensures that the system not only goes in smoothly, but that people will actually use it.

■ **Top-down support.** Putting in voice processing without top management support is like trying to create a snowball by rolling it uphill — it can be done, but not without a lot of effort.

Implementing voice processing is strenuous enough without the additional challenge of building support from the bottom up. Get management to be the standard bearer. Management cannot merely give lip service to voice processing. They must endorse it emphatically, continually and visibly.

■ **Know your system.** While many industry experts will agree that private branch exchanges have reached a level of parity, a closer look uncovers differences that can have a significant impact on how well your new voice processing system works with your existing PBX.

Jane Videtich, systems development manager for R.J. Reynolds Tobacco Co. in Winston-Salem, N.C., explains the importance of knowing your system.

"Integration of the voice processing system with a PBX or Centrex, such as we have, is an absolute requirement," she said. "But even beyond that, there are differences in how different PBXs and voice processing systems work together. Some can distinguish between a busy signal and no answer [or between] an internal call and an external call. Call forwarding patterns differ from system to system."

R.J. Reynolds selected a Digital Sound Corp. voice processing

(continued on page 12)

Fermazin is a senior technology analyst with Amoco Corp. in Chicago.

Users the victors in heated carrier wars

Customers are winning concessions in custom net deals as carriers scramble to land contracts.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Competition for large corporate customers has become so fierce that carriers are offering users all kinds of concessions in custom network deals, according to tariff experts speaking at a conference here last week.

"Everything's fair game; there are very few constraints" in negotiations, said Steve Martin, senior manager in the management consulting division at Deloitte-Touche, a consulting firm in New York. "Everything you knew about tariffs before is now bilge water."

Martin and other speakers at the conference — sponsored by TeleStrategies, Inc. of McLean, Va., and Washington, D.C. law firm Morrison & Foerster — encouraged users to be aggressive in dealing with carriers.

In addition to traditional contract provisions such as outage credits, implementation guarantees, error rates and volume commitments, carriers are agreeing to such unusual provisions as controlling access of carrier personnel and user sites, as well as enabling users to fire carrier representatives, according to Henry Levine, an attorney with Morrison & Foerster who has negotiated a number of custom network deals.

Due to billing problems users have experienced with AT&T's Tariff 12 and Software-Defined Network services, Levine said, customers are also beginning to demand guarantees of bill delivery and electronic real-time access to billing information.

He said one of the more unusual provisions he helped a customer negotiate had to do with guaranteed service, even during a natural disaster. The user got a guarantee from AT&T that it would do whatever it takes, including setting up personnel on cots in the network control center, to ensure someone will be available to run the network.

(continued on page 12)

WASHINGTON UPDATE

BY ANITA TAFF

RBHC issue divides Senate allies. The efforts of several senators to pass legislation that would release the regional Bell holding companies from the Consent Decree ban on manufacturing has deeply divided members of a committee that oversees communications issues. In a recent report to the Senate explaining the need for such legislation and discussing the bill's various provisions and safeguards, two of the oldest allies in the Senate Committee on Commerce, Science and Transportation expressed sharply opposing views.

Sen. Ernest Hollings (D-S.C.), chairman of the committee, has championed the bill he introduced last November. The bill would allow the RBHCs to manufacture through separate subsidiaries. It requires the carriers to do all manufacturing in the U.S., including the production of components. It would also require a new set of regulations to be developed by the FCC to guard against anticompetitive behavior.

However, Sen. Daniel Inouye (D-Hawaii), a member of Hollings' committee, strongly opposed the bill when it was voted on in committee. In the subsequent committee report, he included a harshly worded, 13-page denunciation of the legislation. "Chairman [Hollings] has often stated that there's no education in the second kick of a mule — that goes for the third and fourth kick as well," Inouye said, adding that Congress did not learn its lesson from divestiture the first time around.

Inouye said that if the RBHCs are freed from the Consent Decree restrictions, it will "set in motion a cycle of conflict and uncertainty that will eventually lead back to the courts for resolution. We have only vague promises of what the [RBHCs] can bring to the marketplace."

Users the victors in heated carrier war

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Joaquin Gonzalez, vice-president of global networking strategies at the META Group in Westport, Conn., agreed that carriers are increasingly willing to negotiate on almost any point. In the past, carriers used tariffs like a shield: They told customers they could not do certain things because of the tariff, he said. But today, carriers' attitudes are radically different.

"I don't believe that regulation is that much of an issue any more," Gonzalez said. "Carriers will negotiate based on the need to retain a customer, not on what they think the regulators will allow," he said.

This means that telecommunications managers must sharpen their negotiating skills. "If you want [prices on a certain service] to drop 50% in the next three minutes, all you have to do is ask" and be a tough negotiator, Gonzalez said.

Users are also finding ways to off-load cumbersome network tasks onto the carriers through custom deals. "Anything that might go under the heading 'drudgery' is something [users] might want to ask the carrier to do," Gonzalez said. Examples of activities that users have negotiated as part of custom network deals are network management and billing, he said.

Customers have also become creative in pressing carriers for new rate structures, Deloitte-Touche's Martin said. Several customers have asked carriers for postalized, or nondistance-sensitive rates, he said. The advantage of such a scheme is that it enables customers to more easily compute the network costs of any given unit and verify billing.

Art Katz, another attorney with Morrison & Foerster, said users have successfully pressed carriers for the ability to renegotiate prices and to allow users to audit bills and have carriers assume some of the cost of the audits if too many errors are found.

It is also important for users to protect themselves from any unforeseen industry changes when forging custom network deals, Levine said. Some users have negotiated concessions on annual minimums in the event that they suffer a downturn in business or sell a major division, he said.

Additionally, users should try to protect themselves from regulatory problems. "Users should make sure that if something happens, such as the court throwing out Tariff 12, the carrier will either help you out or let you go [without penalty]," Levine said.

Even though users have been winning big with custom net deals, they should be aware that it takes time to negotiate contracts with carriers, Martin said. He urges users to allow about twice as long to solicit a custom deal as it would take to purchase network services out of general tariffs.

Katz said he agrees that users must be willing to go through a long process to get good deals. "One of the most important aspects of the deals is having the patience to get it done," he said. ◻

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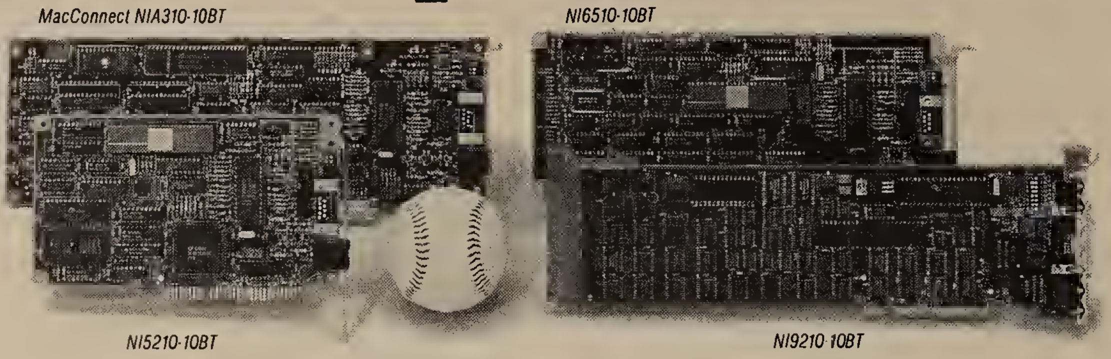

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See The FAXNet Form on Page #18

Installing a voice processing system

continued from page 11

system because it could be tightly integrated with its Northern Telecom, Inc. DMS-100-supported Centrex system. Callers receive different voice mail greetings depending on whether the called party is on their phone or away from their desk. External callers are routed to a voice mailbox, while internal callers are assured of a timely response with the help of the Centrex system's automatic callback feature.

Knowing what your PBX can or cannot do will help you avoid having to settle for a system short on functionality.

■ **Have a little class.** In all respect to the U.S. Constitution, not everyone should be treated equal — at least not when they are calling your firm. Savvy communications managers discovered long ago that callers can and should be viewed as different classes.

According to Marc Robins, author of *Voice Mail Reference Manual & Buyer's Guide,* "Not all callers are looking for the same information. New callers most likely want to talk to a live person, while regular callers know who they want to talk to and want to get to that person in the fastest, most efficient way possible."

Robins suggests having a listed number for new callers that would be answered by a live operator and another number that would go to an automated attendant system. Publicize the automated number on business cards, company stationery and brochures. Give callers the option of live answering or automated answering.

■ **Training camp.** Shortly before the fateful day arrives to fire up your new system, there's the matter of training users. Remember that users are not as familiar with the system as you are after months of planning. If time allows, plan a two-tier training program with a basic class to get users started and an advanced class as close to the cutover date as possible. Schedule the second class a few weeks to a month after cutover.

■ **One thing at a time.** Did you hear the one about the communications manager who cut over a new PBX and voice processing system on the same Monday morning? Yes, it's happened. Sometimes it can't be helped, but it should be the exception and not the rule.

Training should be designed to give users an initial comfort level. Imagine having to learn the idiosyncrasies of two systems at once. One communications manager we talked to typically allows six weeks between PBX and voice processing system

(continued on page 54)

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

"People in the press have said minicomputers are dead. So we'll just call them servers."

Ken Olsen
President
Digital Equipment Corp.
Maynard, Mass.
Speaking about client/server computing at DECworld '90

Data Packets

BT Tymnet, Inc. last week announced a new service intended to lower the cost of linking an X.25 host to the Tymnet public packet network by offering users a single flat monthly rate for all required products and services.

With the new Xlink Express service, users pay $900 per month for unlimited data transmission over a 19.2K bit/sec host link to Tymnet that supports up to 64 virtual circuits.

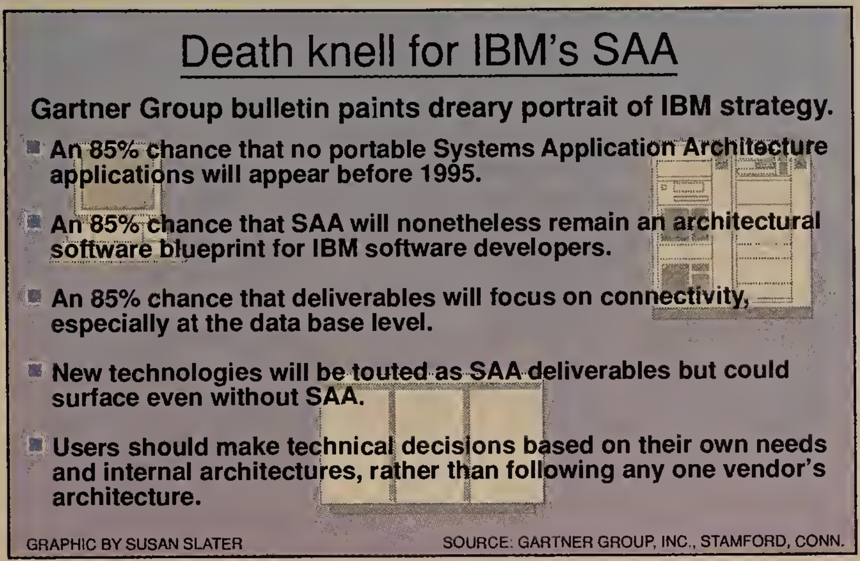
Previously, users would pay an average of $1,500 for a 9.6K bit/sec leased line to Tymnet, including modem and interface costs.

Xlink Express is currently available in more than 175 U.S. cities.

NCR Comten last week announced software that enables **Systems Center, Inc.**'s Net/Master network management system to control NCR Comten front-end processors. The software is an enhancement to the Comten Support Facility (CSF), which lets users manage NCR Comten processors through IBM's NetView.

The new software, dubbed CSF Net/Master, lets Net/Master users view network alarms, enter NCR Comten system console commands and receive responses. The software is required in every NCR Comten processor managed by Net/Master.

Available now, CSF Net/Master costs $1,000 for an initial license fee, plus $300 for a monthly license fee for the first front-end processor. For additional processors, there is a $50 monthly fee but no initial license fee. ◘



Death knell for IBM's SAA

Gartner Group bulletin paints dreary portrait of IBM strategy.

- An 85% chance that no portable Systems Application Architecture applications will appear before 1995.
- An 85% chance that SAA will nonetheless remain an architectural software blueprint for IBM software developers.
- An 85% chance that deliverables will focus on connectivity, especially at the data base level.
- New technologies will be touted as SAA deliverables but could surface even without SAA.
- Users should make technical decisions based on their own needs and internal architectures, rather than following any one vendor's architecture.

GRAPHIC BY SUSAN SLATER

SOURCE: GARTNER GROUP, INC., STAMFORD, CONN.

Report says IBM falling short on SAA promises

Claims IBM is pulling back on portability issues.

By Paul Desmond
Senior Editor

STAMFORD, Conn. — The research firm Gartner Group, Inc. has issued a scathing bulletin that says IBM's Systems Application Architecture (SAA) is geared more toward marketing than technology.

IBM has positioned SAA, which was introduced in March 1987, as an architecture that would lead to the development of portable applications that could be used with four operating systems: MVS and VM on System/370 mainframes; OS/400 on the Application System/400 minicomputer; and OS/2 Extended Edition on Personal System/2s.

In theory, SAA applications could run on any of these machines, a feat that would make it easier to develop distributed applications.

But Gartner Group claims IBM is reneging on the strategy.

"IBM not only has made no progress toward portability, it's pulled back its commitment to portability, which it initially marketed heavily," said Michael Braude, senior vice-president and chief research officer for Gartner Group here.

IBM said any application that was deemed to be SAA-compatible would be available across all four SAA environments within two years, according to Braude. But that hasn't proven to be the case.

One example is RPG, a programming language for the System/36, AS/400 and PS/2. Braude said IBM announced RPG as an SAA language in March 1988 to make SAA more attractive to the large installed base of System/36 users but never really intended to support it on mainframes.

Another example is CSP, which Braude said was designated as an SAA fourth generation language in March 1987 but has yet to be delivered for the AS/400.

Gartner Group's bulletin said there are no truly portable SAA applications in existence today and predicts there won't be any until at least 1995 (see graphic). Some SAA applications may function the same across two or more SAA platforms, but the physical code will not be identical, according to the company.

IBM's concept of Common User Access (CUA), which is the promise that all SAA applications will have the same look and feel, is another shortcoming of SAA, Braude said. Today, there are different versions of CUA, based on different versions of Presentation Manager. Also, he said, IBM has sanctioned third-party vendor applications as SAA-compatible even though they have dissimilar user interfaces.

Braude said the accusations levied against IBM also apply in principle to other vendors and added that users eventually will want to be independent of any vendor's architecture.

"I recommend that users make technical decisions based on their own internally developed architectures and real business needs, and not listen to any one vendor's proposed architecture and blindly fall into line with it," he said.

In response to the bulletin, IBM issued a statement through a spokeswoman that said, in part, "Customer acceptance of [SAA] products has been excellent, exceeding expectations. Many customers have made a commitment to use SAA as the framework on which they will base their own information processing strategies."

Frank Dzubeck, president of the Washington, D.C. consultancy Communications Network Architects, Inc., also refuted some

(continued on page 14)

Justice Dept. probes legality of airline net

Investigation scrutinizes ATP, an airline fare quote network, for possible violation of antitrust laws.

By Paul Desmond
Senior Editor

WASHINGTON, D.C. — The Department of Justice is investigating whether major U.S. airlines are violating antitrust laws by using a fare quote network to engage in price collusion and ward off competitive threats in key markets.

The investigation will attempt to determine whether airlines are using a network run by Airline Tariff Publishing Co. (ATP) here to announce future rate changes to see how other airlines will react. Also under investigation is whether airlines have been using the ATP net to send veiled threats to competitors regarding fares.

All the airlines contacted by *Network World* either denied any wrongdoing or declined to comment. Some did not return phone calls.

"We're looking at pricing practices for possible violations of the [Sherman] Antitrust Act," said Joseph Krovisky, public information officer for the Justice Department. "We are gathering information on the airlines' relationship with the Airline Tariff Publishing Co."

ATP is owned by a group of major North American and foreign airlines, including American Airlines, Inc., Eastern Air Lines, Inc., Pan American World Airways, Inc. and Trans World Airlines, Inc. The network is subscribed to by about 240 airlines worldwide, said Mike Ferrier, senior vice-president of computer services for the company.

ATP maintains a data base of all airline fares at its Dulles Airport data center near here. Subscribers can tap into the data base and upload changes or download data via leased-line, dial-up or public packet net facilities.

"It is simply used to make competitive fare information available in a reasonably convenient manner," said Art Kent, vice-president of corporate com-

(continued on page 14)

Vitalink to ease routing by adding DECnet support

By Jim Brown
Senior Editor

FREMONT, Calif. — Vitalink Communications Corp. recently announced it will add Digital Equipment Corp. DECnet Phase IV routing support to its TransPath routers to enable customers to mix them with DECnet routers in the same network.

Vitalink will add the support by licensing DECnet routing software under a technology exchange agreement it signed with DEC last month. Supporting DECnet Phase IV routing will enable customers to build multiprotocol routing backbones with TransPath routers without having to replace existing DECnet routers that support DECnet Level 1 routing.

Under Level 1 routing, routers — also referred to by DEC as intermediate systems — pass traffic between DECnet nodes within a single DECnet area that comprises several different Ethernets. By supporting DECnet Level 1 routing, TransPath products can communicate with DEC's Level 1 routers. This enables TransPath to act as an intermediate system capable of routing traffic between end stations, such as a VAX or a workstation within a DECnet area.

Alternatively, TransPath can transmit traffic destined for other DECnet areas over wide-area links to another TransPath router by using Vitalink's proprietary protocol. The receiving TransPath can then route the traffic through DEC's Level 1 routers within the DECnet area to reach the final destination.

Vitalink routers currently are not able to communicate with DECnet Level 2 routers, which pass DECnet traffic between different DECnet areas. This is because TransPaths do not support DEC's Digital Data Communications Message Protocol, which defines how two remote DECnet routers communicate.

"There isn't 100% interoperability between Vitalink and DEC routers," said Dana Hendrickson, assistant vice-president of business development. "You cannot have a Vitalink router at one end of a wide-area link and a DEC router at another."

(continued on page 14)

Vitalink to ease routing with DECnet

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However, he said, TransPath routers will support DECnet Level 2 routing using Vitalink's router-to-router protocol. This will enable users to interconnect LANs supporting DECnet and other traffic over a single backbone. DECnet routers do not support multiple protocols.

TransPath routers currently only route Internet Protocol traffic. But in addition to adding DECnet support, the company pledged earlier this year to add support for several other protocols including Novell, Inc.'s Internetwork Packet Exchange (IPX), Xerox Corp.'s Xerox Network System (XNS), Ungermann-Bass, Inc.'s implementation of XNS, Apple Computer, Inc.'s AppleTalk and protocols in the Government Open Systems Interconnection Profile.

Because Vitalink promised it would enhance TransPath to support these other protocols first, Hendrickson said, DECnet Phase IV Level 1 routing support will not be available until the second quarter of 1991.

According to Hendrickson, Vitalink intends to add DECnet Phase V routing support to its routers and will announce later this year that it plans to add support for DEC's Network Information Control and Exchange (NICE) protocol. NICE will enable DEC's existing VAX-based network management software to monitor, configure and control the operation of TransPath routers.

Justice Dept. probes legality of airline net

continued from page 13

munications at Continental Airlines Corp. in Houston. "It's not a means of communications [among airlines]."

But a reporter from *The Wall Street Journal* subscribed to the ATP net and claimed in a front-page story published late last month to have seen evidence that airlines used codes attached to fares to warn competitors to stop so-called predatory pricing.

According to Ian Ayres, an associate professor at Chicago's Northwestern Law School and an antitrust expert, predatory pricing has to do with airline hubs, which are airports dominated by one or two airlines. One airline can try to steal business from another by lowering fares into or out of the target airline's hub.

While there is nothing illegal about airlines cutting prices in response to competitive pressure, it is considered illegal for an airline to cut prices below what it costs to offer a particular flight or to reduce prices for no other reason than to deny or undercut a competitor's profit. It is also illegal for an airline to communicate with a competitor in an effort to influence prices.

One of the questions regarding the ATP net is whether airlines tried to communicate with one another by attaching codes to fares posted in response to competitor price cuts, Ayres said. Such codes could be construed as veiled threats to stop price war tactics.

"The [ATP network] might have facilitated this a little bit with the ancillary codes that accompanied these fares," Ayres said. "As far as trying to prove that stuff to a jury, the codes might be the kind of smoking gun that helps Justice if they decide to proceed."

Subtle collusion?

Ayres said it is also possible that the ATP net is being used for a form of collusion that involves a technique known as preannouncing, which is when an airline makes public its intention to raise fares. Other airlines accept the offer to collude by raising their prices, he said.

If none do, the airline that originated the fare increase can back off without ever actually raising its fares and taking the risk of lost market share.

"It's possible that this new technology is a substitute for the traditional ways of price fixing," Ayres said. "The old way of colluding was getting on the phone or going through a trade association."

But others said airlines can do the same thing with or without networks like ATP's.

"I really don't think there's much substance to the contention that airlines are operating illegally through ATP," said Donald Garvett, a former executive with a major airline and currently vice-president at SH&E, Inc. in New York, a consultancy specializing in airlines. "I don't think it makes it any easier to [break the law]. I'm aware of no misuse of it."

A spokeswoman at Delta Air Lines, Inc. echoed Garvett's comments. "We don't perceive that there's a problem, and we aren't concerned about the investigation."

Ayres said the Justice Department investigation marks a departure from the Reagan administration when only blatant violations were investigated.

"This investigation is going into uncertain and unchartered waters," Ayres said. "It's pushing the envelope of the law."

Report says IBM falls short on promises

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of Gartner Group's claims.

Dzubeck said IBM has not backed off its commitment to SAA and that it is unreasonable to expect users to risk mission-critical applications by making rapid, wholesale strategy changes. Instead, users are choosing to become "a little bit pregnant" in terms of SAA, Dzubeck said.

"That's physically impossible in a human being, but it is possible with architectures," Dzubeck said. "[Users] are going to get more pregnant as time goes on, and they are going to mature along with the delivery of the systems."

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1	HOW DO I DO IT?	DATA BASES SQL & WINDOWS	WINDOWS TO MAINFRAMES	WINDOWS SUPPORT SERVICES	MICROSOFT. A CONFLICT OF INTEREST?	MULTIMEDIA STANDARDS FOR WINDOWS
2	WHAT DOES IT COST?	WORD PROCESSING	TOKEN RING vs COAX vs LAN GATEWAYS	OUTSOURCING	TO "C" OR NOT TO "C"	WINDOWS & THE FEDERAL GOVERNMENT
3	MIGRATING FROM MAINFRAMES TO A WINDOWS LAN	APPLICATION SUITES	NETWORK TUNING ISSUES	MEDIA	EUROPE EAST & WEST	IMAGE PROCESSING & WINDOWS
4	WINDOWS OR OS2	GRAPHICS	EXPLOITING DDE ON A NETWORK	ALI OOPS!	MAC LIFELINE	WINDOWS 3.0 CRITIQUE
5	PRODUCTIVITY & WINDOWS	SPREADSHEETS	COMMUNICATIONS	MULTIMEDIA	WINDOWS MARKETING IN THE U.S.	WPMA ROUNDTABLE
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John Rose
Manager of personal
computing systems
Digital Equipment Corp.
Littleton, Mass.

Netnotes

Hughes LAN Systems last week said that its 9100 Network Management Center software now runs on Sun Microsystems, Inc.'s Unix Reduced Instruction Set Computer-based Sun 4/SPARCstation. The software supports the Simple Network Management Protocol standard.

Previously, the software only ran on the smaller, less powerful Sun 3 workstation, which processes 3 million instructions per second (MIPS). The Sun 4/SPARCstation is available in configurations that process from 12 to 40 MIPS and, at $18,000, costs the same as the older workstation, said Kishore Tarachand, Hughes LAN Systems senior product line manager.

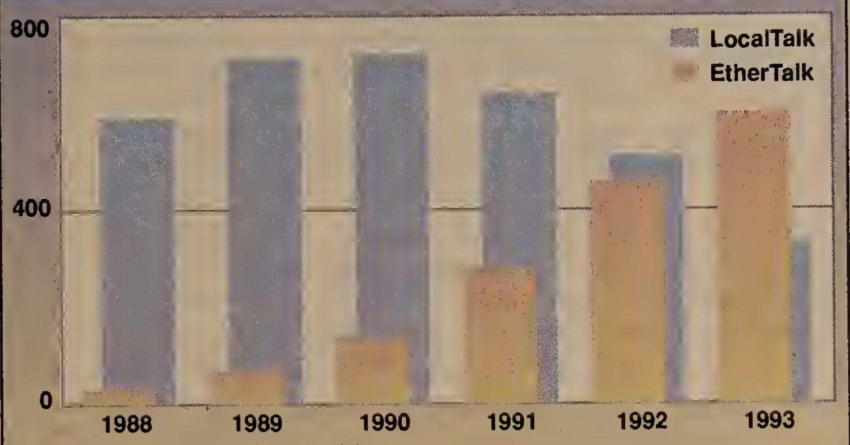
"The SQL data base resident in the 9100 Network Management software can accommodate up to 25,000 nodes on the Sun 4/SPARCstation," Tarachand said.

The data base management functions are used for functions such as the storage and recall of network configuration data.

The 9100 Network Management Center software is available now and costs $14,950.

For more information, contact Hughes LAN Systems at 1225 Charleston Road, Mountain View, Calif. 94043; (415) 966-7300.

Macintosh users graduate to Ethernet



▲ Worldwide units (thousands)

LocalTalk, Apple Computer, Inc.'s entry-level peripheral sharing network product, will lose favor over time as Macintosh users migrate to Ethernet LANs.

GRAPHIC BY SUSAN SLATER SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Program gives LAN users access to international net

ViTel net links switching centers around the world.

By Susan Breidenbach
West Coast Bureau Chief

MILL VALLEY, Calif. — ViTel International, Inc. has released a software product that enables personal computer users to access its worldwide value-added data net from LANs running Novell, Inc.'s NetWare.

ViTeLink 3.5, a new version of the company's ViTeLink software for stand-alone personal computers, enables NetWare users to create, transmit, track and archive electronic mail, and facsimile and telex messages from their desktops without having to purchase any additional hardware.

While the stand-alone version required a separate modem for each personal computer, the new release enables users to share a single connection to the ViTel network via a workstation on the local-area network that is designated as either a dedicated or nondedicated modem server. ViTel can be accessed using dial-up or leased lines.

"Our traditional base of customers was installing more and more NetWare LANs and kept asking us for this capability," said John Stone, ViTeLink product manager at ViTel. "They were screaming to be beta sites."

ViTel began operations in the mid-1970s as an international store-and-forward telex carrier for users of host-based computer networks. The company expanded into E-mail and fax services in the 1980s and added the first version of the ViTeLink personal computer front-end software in 1988.

The ViTel communications network consists of fault-tolerant switching centers in Australia, Hong Kong, Japan, the U.K. and the U.S. These five centers are linked by dedicated circuits.

By providing LANs with a shared point of entry into the network via ViTeLink 3.5, ViTel is offering companies with worldwide operations a low-cost way to send messages and binary files across the ViTel net to virtually any destination in the world.

A broadcast capability lets users send messages or files to any number of E-mail, fax or telex destinations around the globe. A scripting utility can be used to create and maintain speed dialing for frequently contacted individuals or distribution lists, while password-controlled encryption is available for confidential messages.

An automatic delivery service enables LAN users to receive messages in background mode and be notified of them while working in other applications. The product also automatically tracks messages, providing users with message-delivery confirmations and other information about message status as requested. In addition, an archiving facility can be used to manage stored messages and files.

ViTeLink 3.5 includes a basic E-mail package that can provide for internal LAN messaging in lieu of a separate LAN E-mail system. "This intra-LAN messaging capability makes ViTeLink an extremely powerful and low-cost tool for companies who require a single solution for internal and external electronic mail," said Bruce Cohen, president of ViTel.

ViTeLink 3.5 costs $1,295 per installation, supporting an unlimited number of LAN users.

For more information, contact ViTel at 100 Shoreline Highway, Mill Valley, Calif. 94941; (415) 332-5134.

Windows gains favor as network interface

Top LAN vendors say Windows 3.0 will become a corporate graphical user interface standard.

By Susan Breidenbach
West Coast Bureau Chief

SAN FRANCISCO — Two months out of the gate, Microsoft Corp.'s Windows 3.0 is burning up the best-seller list and communications software developers seem convinced it will become a corporate standard for interfacing DOS workstations to local- and wide-area networks.

All the major network operating system vendors — including Banyan Systems, Inc., Novell, Inc. and 3Com Corp. — have their client shells, or DOS redirectors, running under Windows 3.0. And developers of 3270 gateway products have been almost as quick to embrace the new graphical user interface as a window through which LAN users can view the mainframe world.

The vendors agree that Windows' historic "unnetworkability" is largely a thing of the past and it now adds considerable value to their products.

"The graphical user interface, memory management and multitasking capabilities of Windows 3.0 are vital to our customers, who generally have 1,000- to 10,000-node networks," said Ralph Ungermann, president of Ungermann-Bass, Inc. Putting a network's client software under Windows 3.0 provides LAN users with "fast and simple navigation throughout the enterprise, increasing productivity and reducing training time."

Besides providing users with point-and-click access to resources scattered across LANs and WANs, Windows 3.0 has much-improved memory management capabilities that help eliminate the traditional RAM-cram problems LAN users encounter.

"Loading network drivers has always taken too much memory away from the application," said Stan Levine, vice-president of Automated Design Systems, Inc., an Atlanta-based developer of Windows-based tools for building LAN applications.

"Ironically, the more we use LANs, the worse the problem be-

(continued on page 16)

Sun add-on products help speed up SPARCserver line

By Laura DiDio
Senior Editor

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. last week introduced a trio of add-on hardware devices that speed the response time of Sun's SPARCserver family of servers by as much as 75%.

The first product, Prestoserve, is a Network File System (NFS) accelerator board that Sun has licensed from Legato Systems, Inc. NFS, part of Sun's Open Network Computing technology, is the de facto standard for file sharing in multivendor networks.

The Prestoserve board is an internal adjunct processor and works in conjunction with the CPU in Sun's high-end SPARCserver 470 and SPARCserver 490. The board decreases file server response time up to 75% by speeding the process of NFS writes to disk by caching them to random-access memory in the server, according to Greg Munster, Prestoserve's product manager.

Prior to this, all writes were done directly to the disk, a process that was more time consuming, Munster said.

"Until now, users had to wait for the writes to be completed and stored on the disk. That process is 10 times slower [than the caching process] and often results in significant bottlenecks on heavily loaded servers that were being used for write-intensive CAD/CAM and [computer-aided software engineering] applications," Munster said.

Both the SPARCserver 470 and 490 systems are general-purpose Unix-based servers that can be used for data base, file and compute-intensive applications. SPARCservers support Unix workstations and terminals on Ethernets that use NFS and Transmission Control Protocol/Internet Protocol.

Prestoserve is currently in beta test and scheduled to be available in the fourth quarter of 1990 for $5,995.

Sun's second add-in device is a faster version of its Intelligent

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Windows gains favor as network interface

continued from page 15

comes, due to the memory-hungry networking protocols needed to link our minicomputers and mainframes to the desktop.

Windows 3.0 finally gives us access to the memory we need to build enterprise-wide networks while making our larger LANs easier to use and support."

The developers of mainframe access programs are finding that Windows 3.0 makes it easier for them to combine 3270 emulation with LAN client software.

"Because of the DOS 640K-byte limitation, we were running into space problems and being forced to reduce functionality," said Guy Hoffman, vice-president of Eicon Technology Corp. in Montreal. "Windows 3.0's virtual memory and multitasking capabilities are phenomenal."

Virtually every 3270-emulation vendor of note, including Attachmate Corp., Digital Communications Associates, Inc. and Eicon, have released or announced Windows 3.0 support.

"Windows 3.0 should help users of 3270-emulation technology move to LANs, and that's what people want," said Lisa Dembeck, a systems engineer with Attachmate.

Windows 3.0 is not for all LAN environments, however. It requires relatively high-end workstations that have at least an enhanced graphics adapter, an Intel Corp. 80286 microprocessor and 2M to 4M bytes of memory. Only 80386-based systems can make use of Windows 3.0's enhanced mode for multitasking non-Windows applications, which is what most of the tens of thousands of existing DOS aplications are.

"We bit that bullet a long time ago and standardized on 386-based PCs," said Cheryl Currid, manager of information technology for Coca-Cola Co. Foods Division, a large user of Novell's NetWare. Coca-Cola Foods had decided to make Windows its standard desktop user interface even before the 3.0 release, but Currid said the latest enhancements have made that decision infinitely easier to implement.

One quirk of Windows 3.0 — its swap file feature — makes it somewhat unsuitable for network clients that do not have local hard disks, regardless of their processing power.

To accommodate multiple applications requiring a large amount of memory, Windows 3.0 creates a swap file of up to 3.5M bytes that is used to move programs to disk when the machine runs out of memory. If there is no local hard disk, the contents of the file have to be swapped across the LAN to the file server's disk and back, creating a great deal of additional traffic.

But users such as Richard Retin, a senior technology analyst at Wells Fargo Bank, N.A.'s corporate headquarters here, said such limitations are relatively insignificant when compared to the benefits Windows 3.0 has to offer.

For one thing, Windows 3.0's File Manager makes it easier for LAN administrators to install and upgrade applications. "It took us four weeks to install WordPerfect 5.1," Retin said. "I bet when the Windows 3.0 version of WordPerfect 5.2 is available, it will take us about four hours."

Perhaps more important, however, is Windows 3.0's potential for stabilizing the personal computer industry in the post-Personal Computer AT era, Retin said. Adding workstations from various vendors to LANs has become increasingly difficult because of growing Basic I/O System (BIOS) and hardware incompatibilities.

"When IBM brought the PS/2 out, the one primary standard — the IBM PC AT — went away," Retin said. "Things have been disintegrating into total chaos during the last two years. We have to spend hours getting hardware and software set up and working together."

If application vendors write their applications to the Windows interface and if hardware vendors make sure their machines run Windows, then the graphical user interface can serve as a layer that hides the peculiarities of various systems from application software and thus from users, Retin said.

"Windows 3.0 is absolutely a revolutionary product," Retin said. "It will change the way we look at computing." ◼

Sun products speed up SPARCserver line

continued from page 15

Peripheral Interface (IPI) disk drive controller, which doubles the SPARCserver 490 I/O transfer rate from 3M to 6M bytes when writing to the disk drive.

According to Cheryl Vedoe, director of marketing for Sun's General System Group, both the new 6M-byte and the existing 3M-byte IPI controllers can reside either in the server or in a separate external mass storage device.

The 6M-byte subsystem costs $14,500 and is available now.

Boost in memory capacity

The third add-on product Sun introduced is a 128M-byte memory board that boosts the maximum error-code correcting (ECC) memory capacity of the SPARCserver 470 and 490 machines from 160M to 672M bytes. Higher capacity ECC memory improves overall system performance for large simulation and data base applications, and it increases server expandability by freeing VME board slots, Vedoe said.

The 128M-byte memory board for the SPARCserver 470 and 490 is shipping now; it costs $45,000.

In conjunction with the introduction of the 128M-byte memory board, Sun also cut the price of its existing 32M-byte board by 32%, to $13,000. ◼

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THE INDUSTRY STANDARD

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Dialogue

What problems, if any, do you foresee in establishing networks in Eastern Europe?

"Although we haven't had practical experience managing networks in Eastern Europe, we are watching developments there closely. Initially, it may be difficult to deal with PTTs in East Bloc countries. It would be helpful if an international carrier managed communications on both ends of a circuit going into Eastern Europe. This would be important for line ordering and problem determination, especially since language barriers will certainly complicate the issue."

Edward Ritscher
Vice-president of international telecommunications
Chase Manhattan Corp.
New York

"So far the most important issue is to find out what kind of regulatory enviroment we will have to face in Eastern Europe and what kind of services will be available. We don't know whether we will address local carriers directly or turn to a company that has experience in handling telecommunications with East Bloc countries."

William J. Johnson
Director of telecommunications
Woolworth Corp.
New York

"So far, our major concern is the poor line quality in Eastern Europe. Data transfer or even voice traffic is sometimes difficult to manage.

"It is important to gather regulators, users and local carriers to discuss potential problems prior to establishing a communications infrastructure. If user demands are not served, it will be hard to do business on a day-to-day basis."

Ron Wagner
Telecommunications manager
Mattel, Inc.
Hawthorne, Calif.

"The reunification of Germany will have a significant impact on export regulations to Eastern Europe. Telecommunications in East Germany will advance more quickly than in other East Bloc countries because of heavy investments by West Germany."

Mei Ling
Vice-president of telecommunications
Manufacturers Hanover Corp.
New York

Laptops put BP Oil retail managers in driver's seat

Provide timely information from service stations.

By Wayne Eckerson
Senior Writer

CLEVELAND — When BP Oil Co. equipped its retail field supervisors with laptop computers last year, it made sure the new technology was easy to use and enhanced the supervisors' productivity.

"People only use technology if it's user-friendly and offers a real benefit, like saves them time or increases their productivity," said Patrick Duffy, project manager of retail systems for the oil refining and marketing company.

The laptops, which use proprietary menu-driven software, enable the firm's 100 retail supervisors to track daily fuel and merchandise sales, payroll and a variety of other types of data for the dozen or so outlets they each oversee. Previously, supervisors had to wait several days to get hard-copy reports from headquarters.

By getting next-day information about their service stations, supervisors can identify problems immediately. With the paper-based system, supervisors often didn't know a problem existed until it was too late to correct it, Duffy said.

The laptops are also used by about a dozen district managers who keep track of supervisors and six merchandise specialists who purchase the food, beverages and other accessories for the BP outlets.

Timely information

The 100 BP Oil supervisors use Grid Systems Corp. 140XT laptop computers to dial into a cluster of Digital Equipment Corp. VAX processors at the firm's headquarters here. The VAX cluster compiles data transmitted daily by station managers at BP's 1,200 nationwide outlets.

Besides payroll and sales data, supervisors can download information about inventory, balance sheets, bank deposits and gas prices of competitors for each BP station they monitor.

On workday mornings, BP Oil Co. supervisors often use the laptops from their homes to review sales and inventory data from the previous day. This enables them

(continued on page 18)

A BP station in Nashville, Tenn.

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Name that job. Managers who don't have the ability or time to write accurate job descriptions can now review hundreds of them electronically through the Human Resource Information Network (HRIN).

The Job Descriptions Database (JDES) is a recent addition to HRIN, an on-line information retrieval and communications service that consists of news and data base information on human resource topics. JDES provides hundreds of sample job descriptions for all fields and positions. For example, it contains job descriptions for the positions of manager of corporate telecommunications, telecommunications manager and senior telecommunications analyst.

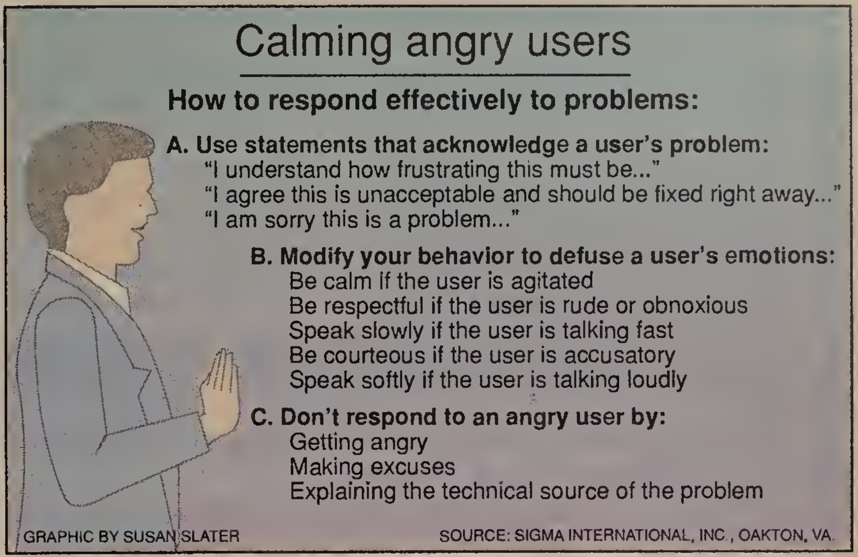
It also contains information on a number of topics, including how to write good job descriptions and how to keep descriptions up to date.

Users can access JDES by subscribing to HRIN, which costs $2,000 for a one-year subscription. For more information, call Executive Telecom System, Inc. at (800) 421-8884.

Over the hill at 30? If you're not married by 30, you could be hurting your chances of getting promoted to a top-level position.

Employees who are still single at age 30 face an invisible barrier that will make it difficult for them to advance to higher job categories, according to James Challenger, president of

(continued on page 18)



Calming angry users

How to respond effectively to problems:

A. Use statements that acknowledge a user's problem:
"I understand how frustrating this must be..."
"I agree this is unacceptable and should be fixed right away..."
"I am sorry this is a problem..."

B. Modify your behavior to defuse a user's emotions:
Be calm if the user is agitated
Be respectful if the user is rude or obnoxious
Speak slowly if the user is talking fast
Be courteous if the user is accusatory
Speak softly if the user is talking loudly

C. Don't respond to an angry user by:
Getting angry
Making excuses
Explaining the technical source of the problem

GRAPHIC BY SUSAN SLATER

SOURCE: SIGMA INTERNATIONAL, INC., OAKTON, VA.

Dealing with angry end users takes tact

Network managers must learn — and train their employees — to handle tough problem situations.

By Wayne Eckerson
Senior Writer

Perhaps the most challenging part of a network manager's job is dealing with angry users whose departments have been adversely affected by a transmission outage or equipment failure.

Unless net managers know how to deflect the ill feelings of users and defuse their anger, they can lose credibility and respect.

Network managers also need to school their employees in dealing effectively with upset end users. The best way to do that is to lead by example, according to Grace Major, president of Sigma International, Inc., a telecommunications training company in Oakton, Va.

"Every net manager is a role model," Major said. "Managers can't expect their subordinates to deal effectively with angry or upset users if they don't do it themselves."

Truth or consequences

Managers employ a variety of techniques to respond to end-user complaints, but most stress the importance of telling users the truth about a situation and verbally acknowledging their concerns or predicament.

A network manager at a large Northeast bank who requested anonymity said he once had to deal with irate users when a computer room operator failed to print an important weekly report.

"We told the users we blew it," the manager said.

"Telling the truth doesn't necessarily make people happy, but it establishes your credibility and makes it easier to work with users in the future," he said. "A lot of people try to hide mistakes, but that is counterproductive."

The key to abating users' anger about a service outage is to try to understand their dilemma.

"Users don't care what caused the outage; they just want you to understand the problems the outage created for them and their department," said Steve Davidson, chief of computer operations for Prince William County, Va. "Explanations about what's causing the problem or excuses about other priorities won't alleviate their anger."

Major said there are three ways managers can empathize with an end user's situation: apologize, agree and acknowledge (see graphic).

Managers should not assess blame, make excuses or propose solutions, but simply show they understand the difficulties and frustrations users are having as a result of a network outage or other failure, Major said. Major's company offers seminars that teach technical managers how to deal with angry users.

> "Users don't care what caused the outage; they just want you to understand the problems the outage created for them," Davidson said.

▲▲▲

A manager's first priority when confronted with irate users should be to reduce their anger level. Major said people's ability to reason is inversely proportional to their level of anger. The angrier people get, the less reasonable they will be.

(continued on page 18)

Dealing with angry end users takes tact

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A surefire technique for calming down an angry end user is to take advantage of the law of reciprocity, Major said. People tend to treat others the way others treat them; if a person gets angry at you, you will likely get angry at them, she said.

But managers should turn the law around and make it work for them. "If you are respectful and polite to angry users, they can't help but be respectful and polite back," she said. "Angry statements only increase a user's anger and create an explosive situation."

Jack McDonough, manager of information services at Network World, Inc., said he relies on a sense of humor to alleviate tense situations. He also said it helps to ask a question or two to pinpoint the source of a person's anger or complaint. This makes resolving a situation easier and helps the user keep the problem in perspective.

McDonough, who recently helped cut over a new text-processing network for *Network World,* said users often get angry because their expectations about technology are too high.

"When we cut over the network, many people expected it to work flawlessly at once," McDonough said. "We were happy to get it up and running, and get the newspaper out on time. But there were some initial bugs that caused the system to crash periodically. This made some users upset."

Some network managers, however, said advances in technology have reduced the number of equipment and transmission failures, and hence reduced the number of angry users with which they have to deal.

Bob Domanoski, manager of corporate telecommunications at Ingersoll-Rand Co. in Woodcliff, N.J., said the advent of digital circuits and software-driven communications equipment has all but eliminated user complaints about poor or unavailable phone service.

In 1984, Domanoski said a private branch exchange maintenance person from a vendor spent four days a week onsite, but now the same person only comes once a month. "We have fewer unhappy end users, and we have more time to help those we do have," he said. ◼

BP Oil managers in driver's seat

continued from page 17

to keep better track of station performance and product sales trends, Duffy said.

"If there's a problem at a station, I'll know the day after it happens vs. a week later when I'm there," said Gayle Kitterman, a BP supervisor.

The laptops are equipped with word processing and spreadsheet software from Lotus Development Corp. Supervisors can download sales statistics for a product line or service station into a spreadsheet on their laptops and perform sales forecasts and budget estimates, Duffy said.

Supervisors also take the laptops with them when they visit service stations to review each site's sales, finances and other operational items with the station's manager, he said.

Currently, Duffy is testing an electronic messaging capability using AT&T Mail that will enable supervisors to send messages to their district managers and to one another. He is also building an X.400 gateway to the firm's host-based electronic mail system at its headquarters.

> "The supervisors love the system because it's easy to use and gives them information that helps them do their job."
>
> ▲▲▲

"We expect the system will constantly evolve to provide greater functionality to users," Duffy said. However, increasing the functionality of the system should not interfere with the ability of users to use it.

To make the laptop system user-friendly, the company developed menu-driven software that steps users through every process and makes it easy to send and receive files, Duffy said. BP also provided all supervisors with an initial half-day of training on how to use the laptop and a full day of training on using spreadsheets, word processing and data bases.

"The supervisors love the system because it's easy to use and gives them timely information that helps them do their job better than before," Duffy said. ◼

Executive Briefs

continued from page 17

Challenger, Gray & Christmas, Inc., an international outplacement consulting firm based in Chicago.

Challenger said most employers tend to be conservative and usually hire people who seem to possess values identical to their own. Right or wrong, these employers view managers who are over the age of 30 and single as less settled and perhaps less committed professionally, he said.

"Employers do not advance people who appear to be out of the normal pattern of appearance and behavior," Challenger said.

However, he added, in some professions, such as academic and scientific fields, the marital status of employees is far less significant than the expertise and job skills they have. ◼

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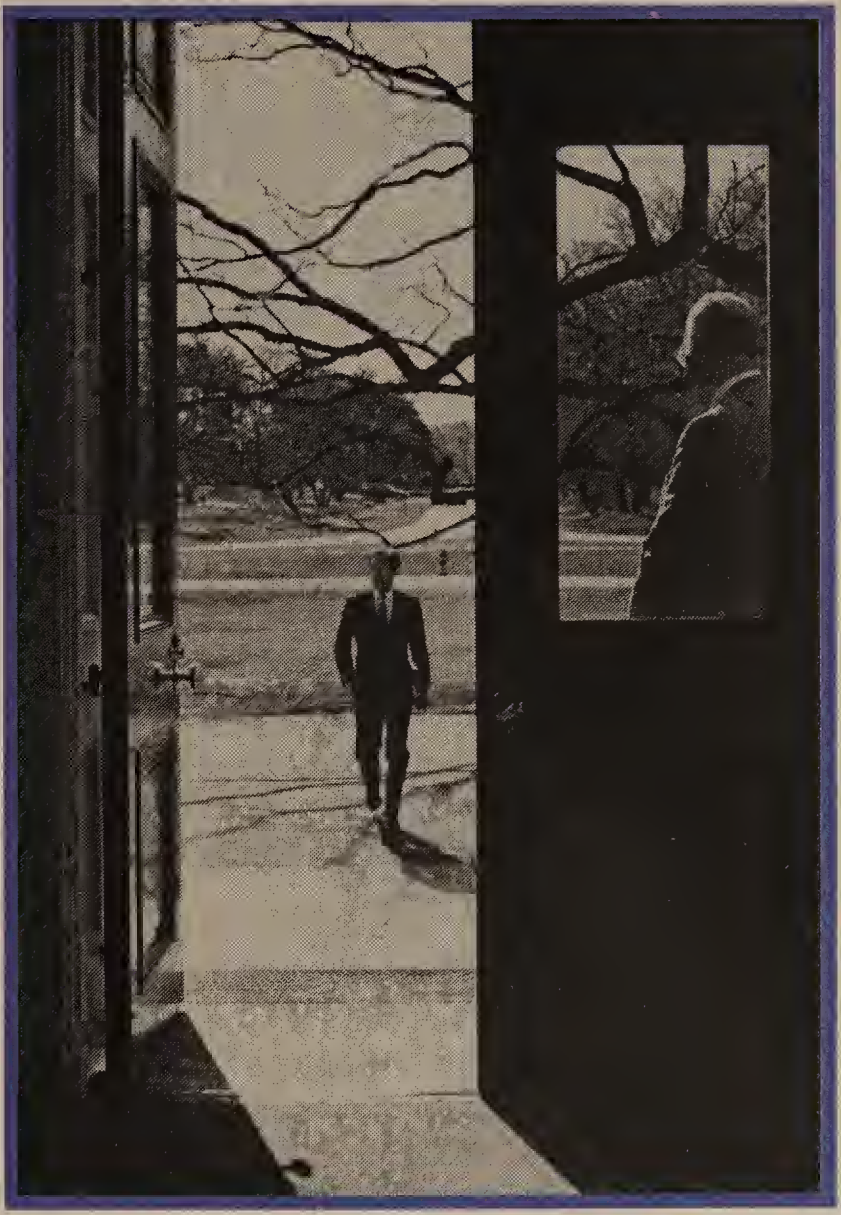

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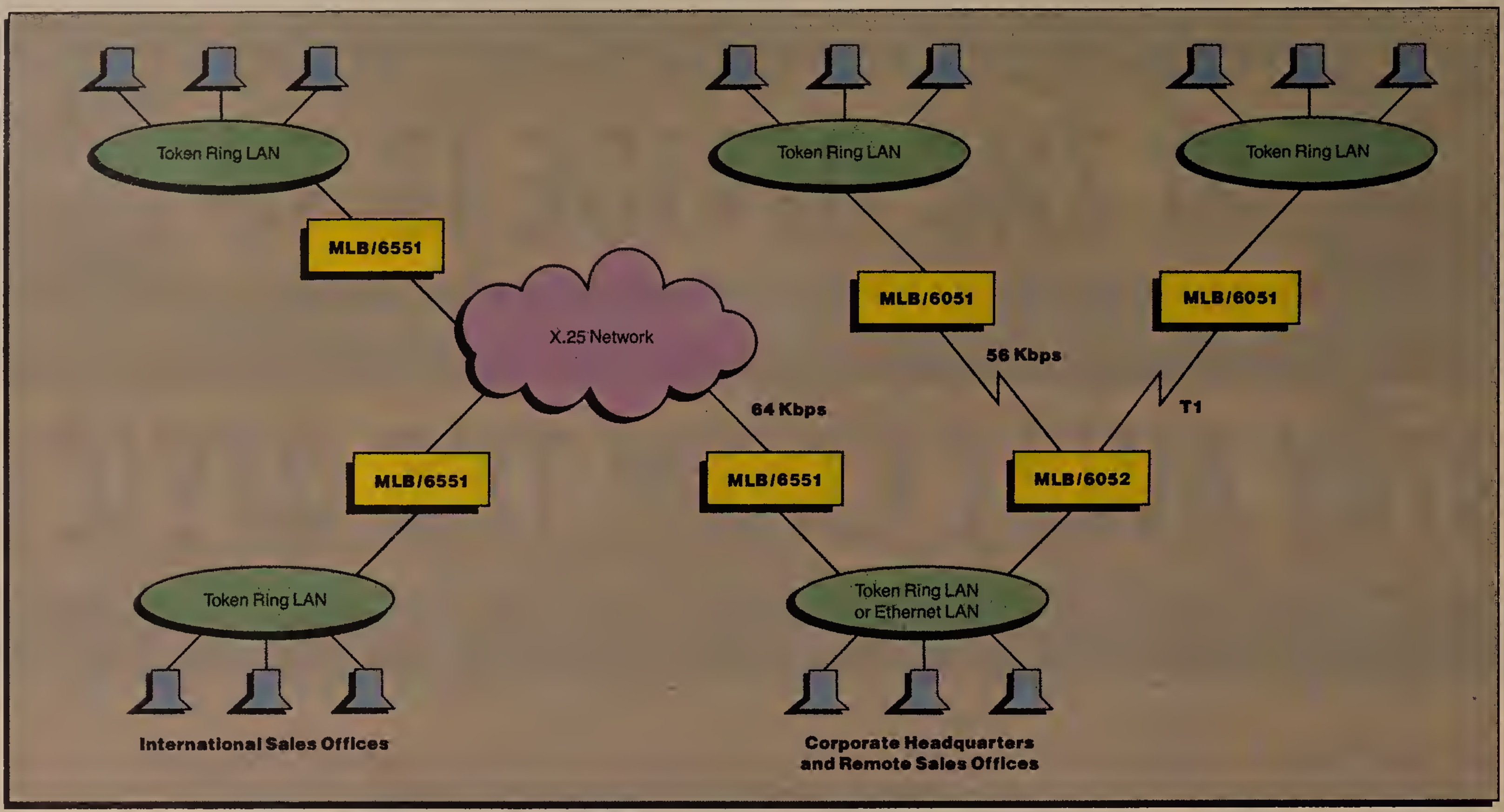

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INTERNATIONAL NETWORKS

USER STRATEGIES, INTERNATIONAL SERVICES & REGULATION

Worth Noting

At a General Assembly meeting earlier this month, the European Telecommunications Standards Institute (ETSI) selected Karl Rosenberg as its director for a five-year term beginning next November. In his new post, the former Deutsche Bundespost official will oversee all of ETSI's pan-European network standards-setting initiatives.

World News

US Sprint Communications Co. last week announced an agreement with the Soviet Union's **Ministry of Communications** to provide videoconferencing services to the country.

The agreement will allow users of US Sprint's Meeting Channel service to conduct videoconferences with users in a new Moscow videoconferencing room owned and operated by the Soviet Ministry of Communications.

According to a spokesman for the carrier, pricing for the Soviet videoconferencing service has not been established. He said, however, that videoconferences will be supported by a 2M bit/sec satellite link, which probably will cost more than $1,000 per hour.

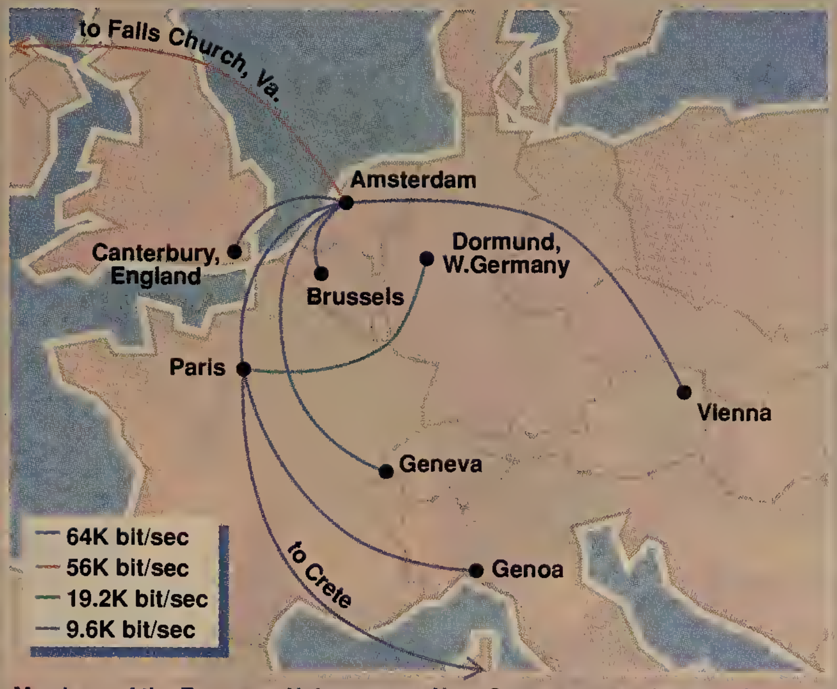
US Sprint's Meeting Channel service can be used to establish videoconferences between more than 700 public and private videoconferencing rooms in 26 countries.

Helsinki, Finland-based **Nokia Corp.** recently announced the opening of the first cellular mobile telephone network in Moscow.

The mobile telephone sys-

(continued on page 25)

The European Unix systems User Group network



Members of the European Unix systems User Group can use the organization's private network for electronic mail and file transfers, and to obtain public domain software from electronic bulletin boards.
Note: Lines from Amsterdam to Canterbury and Paris to Dormund will soon be upgraded to 64K bit/sec.

GRAPHIC BY SUSAN SLATER

SOURCE: EUROPEAN UNIX SYSTEMS USER GROUP, AMSTERDAM

Unix group adopts TCP/IP to enhance European net

Protocol supports file transfers, data base ties.

By Barton Crockett
Senior Editor

AMSTERDAM — A leading European Unix users group is adding TCP/IP support to its network, which will enable members to transfer large files and access data bases on one another's computers.

Previously, the more than 1,500 users of the European Unix Network, operated by the European Unix systems User Group, based here, could only exchange electronic mail and access bulletin board applications.

Support for Transmission Control Protocol/Internet Protocol will enable subscribers to run much more sophisticated applications over the network, perform large file transfers and set up terminal-emulation sessions with remote hosts to tap into data bases.

"We are expanding the network to support the communications needs of our members," said Daniel Karrenberg, administrator of the European Unix Network.

The European Unix systems User Group is made up of national Unix users groups from nearly two dozen countries on the continent.

User demand

Karrenberg said that user demand is driving the European Unix systems User Group's move to support TCP/IP. Typically, members of the users group are involved in computer science or microbiology research. They use the group's Unix network to exchange notes and to access information about the Unix operating system.

Officials with the users group said that adding support for Telnet and File Transfer Protocol will increase the volume and quality of data that users are able to send over the network.

> "We are expanding the network to support the needs of our members."
>
> ▲▲▲

"We want them to have better facilities so they can exchange more information and do better research," he said.

According to Karrenberg, most of the users group's members already support TCP/IP on their internal networks.

Currently, most subscribers to the European Unix Network access it via Unix-based gateway processors on their premises.

In a typical implementation, network traffic flows between a user's gateway processor and Unix processors that act as as end nodes for the European Unix Network. In the past, these commu-

(continued on page 25)

Singapore to bolster net via privatization

Gov't hopes to hand off state carrier to third party in effort to enhance net, draw major users.

By Walter Sweet
West Coast Correspondent

SINGAPORE — The Ministry of Communications and Information here has commissioned a study to determine how best to privatize its state-run carrier, in anticipation of turning over operations to a third party within two years.

Observers said privatizing Singapore Telecom International Private, Ltd., the nation's domestic and international telecommunications carrier, could bring new and improved services to users, as well as lower costs.

"When it goes private, we'll see more products and consumers will have better choices," said Chong Lit, director of the Singapore Economic Development Board.

Government officials made a commitment to privatize the carrier two years ago in an effort to bolster the nation's telecommunications infrastructure and improve its chances of attracting Western businesses to locate operations here.

The upcoming study represents one of the final steps in the effort. Upon completion of the study, Singapore Telecom could be privatized within two years. Currently, the carrier operates the nation's domestic and international telecommunications services, as well as the country's postal system.

According to Teo Poh Wah, a spokeswoman for Singapore Telecom, the government will look at three options for privatizing Singapore Telecom: It could privatize Singapore Telecom and the postal service together; launch both but as separate entities; or spin off Singapore Telecom and keep the postal service under government control.

Teo said government officials consider the postal service to be too labor-intensive and costly to privatize along with the telecommunications company. Consequently, officials are leaning toward spinning off just the telecommunications unit into a separate company.

According to Chong, the government plans to sell a majority stake in Singapore Telecom on the Stock Exchange of Singapore

(continued on page 24)

W. Germany OKs satellites for network transmission

By Barton Crockett
and Ute Ritter
Network World Staff

BONN, West Germany — West Germany reached a milestone on the road to deregulation recently by becoming the first country in Europe's Common Market to allow users to build private satellite networks and to permit competition in the market for satellite services.

The move gives users their first alternative to the German terrestrial network and could ultimately spur price competition between satellite service providers and the Deutsche Bundesposte Telekom.

Late last month, the West German Ministry of Post, Telegraph and Telephone finalized and published new regulations that will be used to grant licenses for satellite networks.

By finalizing its regulations, the West German government lived up to a commitment made more than a year ago when it radically restructured its domestic regulations. The country has also further escalated a trend toward increased competition and fewer private network restrictions on the continent.

"We'd like to advertise that we have the most open satellite policy in Europe," said Peter Bross, department head for satellite and mobile communications regulation with the West German PTT.

Sole proviso

Under the new regulations, users will be able to own and operate their own private satellite networks for the transport of both voice and data traffic. According to Bross, the sole proviso is that users will not be allowed to dump traffic from private satellite networks into the public switched network or use satellite facilities to sell switched services in competition with Deutsche Bundesposte Telekom.

Significantly, the government

(continued on page 24)

My network upstairs won't talk

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Denmark plans to unite carriers to fend off VANs

By Ute Ritter
Correspondent

COPENHAGEN, Denmark — An official of the Danish Communication Ministry last week said the government plans to merge five carriers into a single holding company in an effort to better compete against value-added network (VAN) providers when the European market opens up.

The move will benefit users by establishing a single point of contact for services and speeding the ordering and installation of services, according to Michael Peterson, a telecommunications expert in the Danish Communication Ministry.

The Ministry said it plans to form TeleDanmark AS, a holding company, by merging four regional telephone companies, Fuens Telephone Co., Jutlands Telephone Co., Kopenhagen Telephone Co. and Tele Soender Jutland Telephone Co., as well as Telecom Denmark, an international service provider.

The new company will be allowed to offer both domestic and international services, and it will be 51% owned by the government and 49% by private investors.

"Since foreign VANs have to be allowed in the Danish market from 1992 on, we fear that our carriers would lose business in the videotex or packet-switch market. We further assume that the telephone monopolies in Europe will fall by the end of the century. In such a situation, our five carriers could not compete with the foreign companies," Peterson said.

With the merger, the Danish government said it hopes the combined company will be able to compete against such VANs as GE Information Services, IBM and others.

"The little Danish companies are now competitors. With the merger, they will be powerful enough to compete with the big carriers from abroad," Peterson said.

Three of the regional companies are 50% owned by the government and 50% owned by private shareholders. Tele Soender and the international carrier are state-run companies.

Peterson said the government also plans to license a second mobile communications carrier to compete with TeleDanmark AS. Prime candidates, he said, are Germany's Mannesmann A.G. and Siemens AG. A decision is due in late 1991. Z

West Germany OKs satellites

continued from page 21

decided not to extend this constraint to East Germany. There, Bross said, users will be able to use satellite networks to carry voice traffic across the border to the West German public net or into the domestic public net operated by East Germany's national carrier, Deutsche Post.

"For the [German Democratic Republic], we made a special exception because you have a very, very bad terrestrial network there," Bross said.

However, users will only be allowed to take advantage of the exception if they can prove that East Germany's national carrier is unable to supply them with satisfactory switched voice services in a reasonable amount of time.

In order to operate a satellite network, users or the service providers from which they obtain satellite services will be required to pay a onetime licensing fee of $9,000 to the West German government. In addition, a licensing fee of $1,140 per month will be levied for each two-way satellite earth station in service. A nonrecurring charge of $150 will be levied for each one-way satellite earth station operated.

Bross said the West German government has received no official applications to operate satellite networks so far. He added, however, that more than 80 inquiries have been received and that the West German government expects to grant several licenses in the near future. Z

Singapore to bolster net via privatization

continued from page 21

in order to attract interested investors and a new owner to operate the network.

The government will retain a minority stake in the new company, and it will set up a regulatory agency to ensure that prices won't skyrocket after privatization.

Privatizing Singapore Telecom is being done in conjunction with liberalizing the country's telecommunications policies, including a decision made one year ago that allowed private-sector competition for international value-added network services. Voice mail and a paging service are two offerings that have emerged since the liberalization of those policies.

Due to its relatively small size — the country is just 26 miles wide — Singapore has been able to develop an advanced telecommunications infrastructure. The country has built a national Integrated Services Digital Network and erected two AT&T international digital switching gateways, thereby attracting hundreds of U.S. companies to use it as a telecommunications hub for businesses. Bank of America National Trust & Savings Association, Citicorp, General Electric Co. and IBM all have operations in Singapore.

The country is also spending from $400 million to $500 million a year to upgrade its telecommunications infrastructure, including adding a satellite station to link In-

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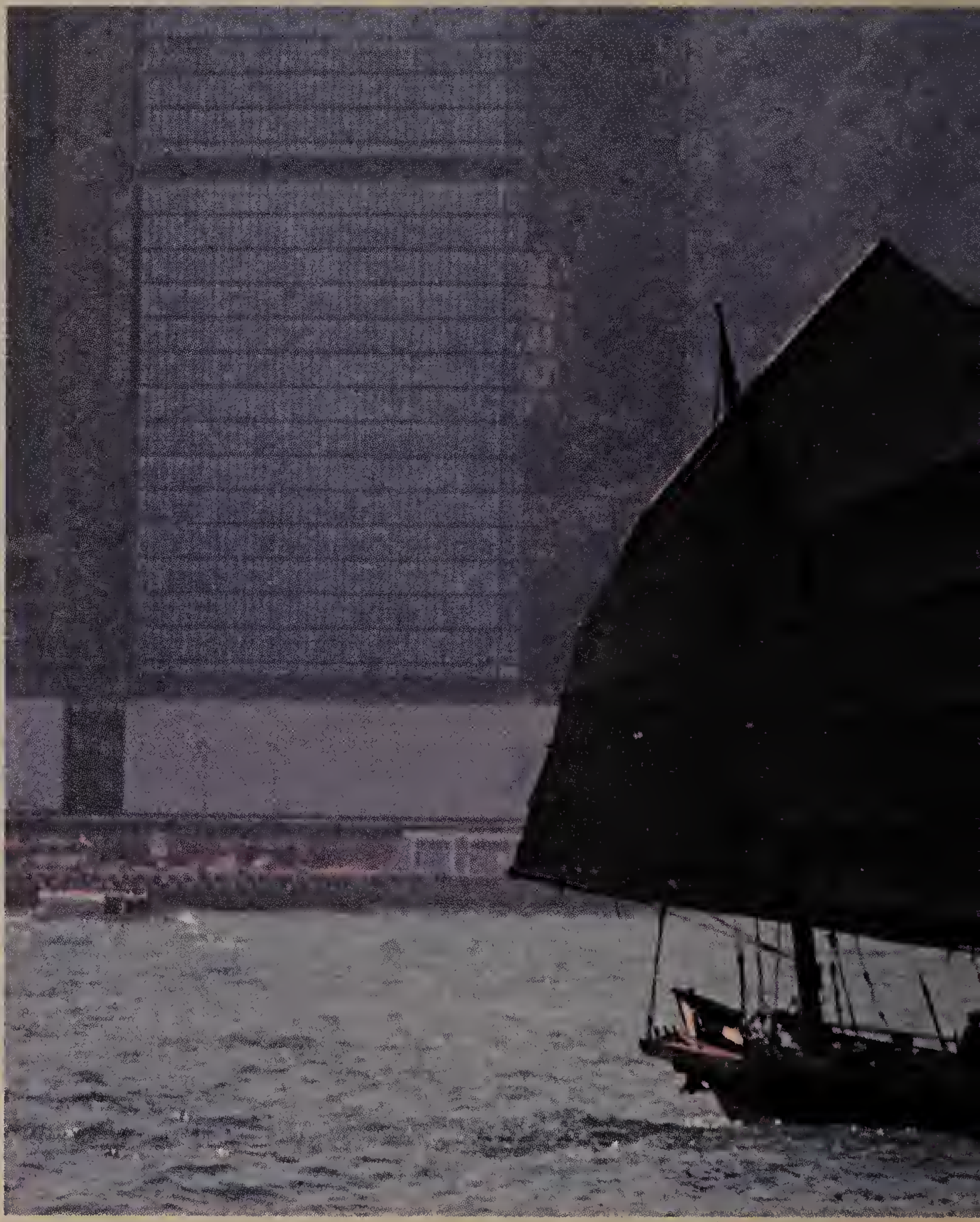

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dia, Europe, Singapore and the U.S., as well as undersea cables going to Brunei that complete a loop joining Singapore with Hong Kong, Korea, Tokyo and the U.S.

Industry observers said privatizing Singapore Telecom will eventually bring about more services for users, including advanced ISDN services and a Public Office Automation System that will allow dissimilar personal computers to communicate through Singapore Telecom.

"ISDN is already in the pilot stage in Singapore," Chong said. "It will be more broadly used with privatization and continued deregulation." He said costs for using ISDN will rival those of analog transmissions, which should make it appealing to users.

World News

continued from page 21

tem, which will be operated as a joint venture with Moscow's local telephone company, will initially serve the city center plus nearby highways and the Sheremetjvevo Airport. Nokia officials expect more than 1,000 subscribers to the net by year end, primarily employees of international companies and embassies in Moscow.

By that time, the cellular network should be expanded to include a service area extending up to a 30-mile radius outside of Moscow. Next year, the joint venture also plans to begin operating a personal paging system over the cellular network that is expected to initially serve 10,000 subscribers.

Columbia University's Graduate School of Business and Center for Telecommunications and Information Studies will sponsor an evening conference on the international competitiveness of the U.S. public network on July 31 at the school's New York campus.

Featured at the event will be presentations from researchers with vastly different views on how well the U.S. public network stacks up to public nets in other countries.

William Davidson, a professor at the University of Southern California, will discuss a study he prepared and recently released that concludes that in some areas, such as investment in digital facilities, the U.S. public network is inferior to public nets in other countries.

Lee Selwyn and Page Montgomery from the Boston consulting firm Economics and Technology, Inc. will present an analysis they recently completed that concludes that this country's public network is second to none.

The results and methodology of each of the reports will be distributed and analyzed at the meeting.

For more information, contact the Graduate School of Business at (212) 854-4222.

At the **PC-World Forum** personal computer trade show in Moscow last week, Bradley Holmes, the U.S. Department of State's coordinator for international communications and information policy, defended recent Bush administration decisions to oppose network-related joint ventures between U.S. firms and the Soviet government.

Among other projects, the Bush administration has denied a US West, Inc. application to build a fiber-optic cable across the Soviet Union and opposed an AT&T request to use Soviet satellites to carry switched traffic between the public networks in each country.

Despite these setbacks, Holmes said he thinks several opportunities remain for U.S. vendors to work with the Soviet government. For example, he said, the Soviet Union plans to triple the capacity of its public telephone system and install five million to six million new telephones per year over the next five years. According to Holmes, U.S. companies might be able to help supply and install some of this equipment.

Unix group adopts TCP/IP to better net

continued from page 21

nications were supported only by network protocols embedded within the Unix operating system.

But Karrenberg said the European Unix system User Group recently added support for TCP/IP protocols at nodes here, and in Dormund, West Germany, and Paris. TCP/IP support will be added to other nodes throughout the year, and full TCP/IP support is expected by 1993 (see graphic, page 21).

Users wanting to communicate via the TCP/IP-based net will typically be required to maintain leased-line connections from devices on their premises to routers or bridges that the users group is installing at its nodes. Alternatively, TCP/IP data can be carried between user devices and the European Unix Network via public data networks.

A handful of users

According to Karrenberg, thus far, only about 50 users have signed up for TCP/IP services on the European Unix Network. One reason for the relatively low response is cost. TCP/IP services on the European Unix Network are far more expensive than bare-bones Unix communications.

For example, Karrenberg said users in the Netherlands pay the Unix users group about $1,000 per month for TCP/IP network services, while subscribers to the older Unix-based E-mail and bulletin board service pay only about $125 per month.

Karrenberg said the nonprofit users group collects this money to offset operational charges and that the TCP/IP network is more expensive to run than the Unix network.

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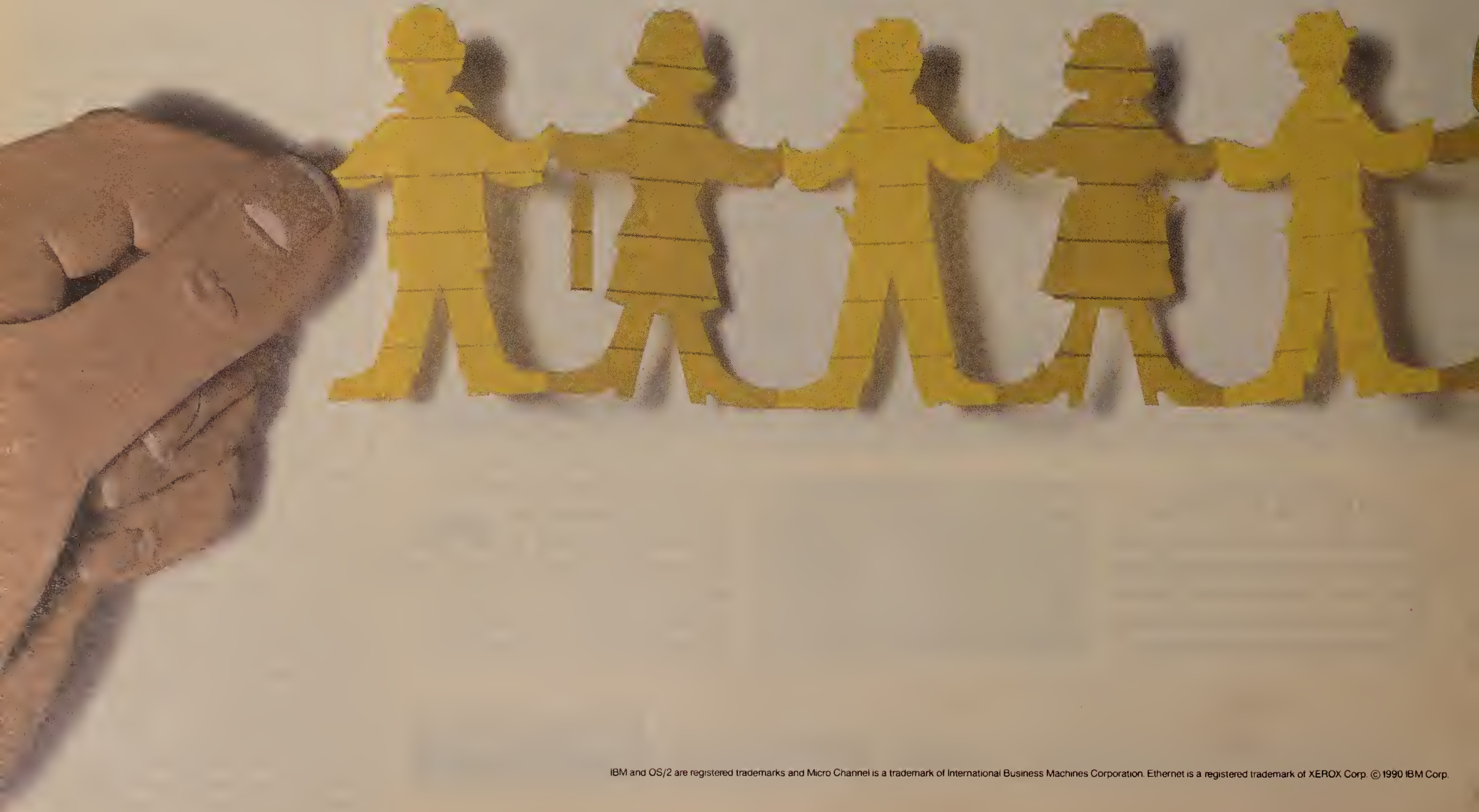

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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Fax interface product designed for ASCII users

T4 Systems, Inc. recently introduced a product that allows ASCII terminal users to transmit documents from a variety of mainframes and minicomputers to any attached Group III facsimile machine.

T4 Multi-Link — which consists of an AT-class personal computer, up to eight facsimile interface boards and software — acts as a printer so the host will be able to route files to it. It supports up to eight telephone lines.

The product is an upgrade of an earlier offering, the T4 Link, that supported only a single telephone line.

T4 Multi-Link emulates IBM 3287, 5256 and serial printers, an ability which enables it to be linked to Digital Equipment Corp., Hewlett-Packard Co., IBM and Unisys Corp. hosts.

With the T4 Multi-Link, users enter the destination name at the beginning of the document to be sent. The T4 Multi-Link custom dialing and retry functions automate the rest of the process. The system's broadcast feature enables users to store and send documents to as many as 2,000 destinations with a single command. The system also features a delayed transmission capability.

The system is available now and comes in four models with two, four, six or eight ports. They are priced at $29,995, $34,995, $39,995 and $49,995, respectively.

T4 Systems, Inc., 8901 Kanis Road, Suite 202, Little Rock, Ark. 72205; (501) 227-6245.

Board, software let IBM PCs talk to TCP/IP nets

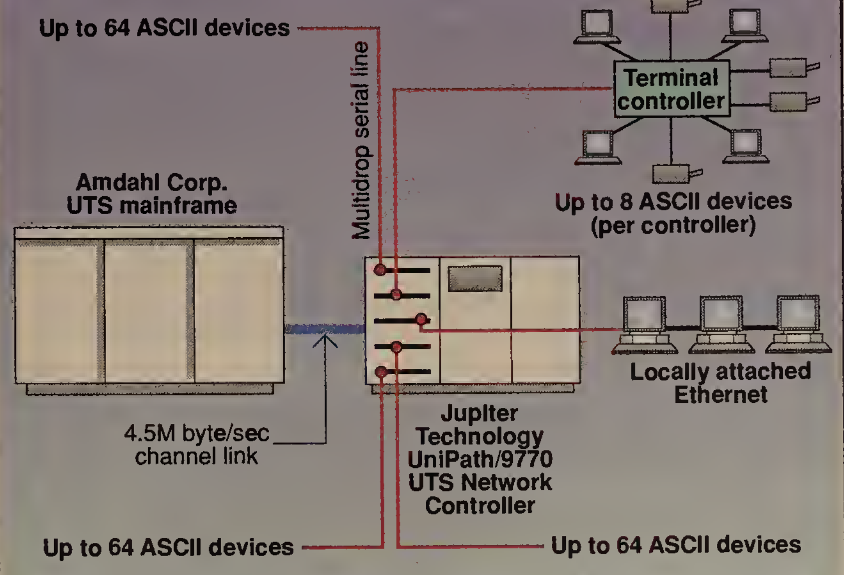
Xinetron, Inc. recently introduced a product that enables IBM Personal Computer ATs and XTs to communicate with Transmission Control Protocol/Internet Protocol networks.

The product, **Netall TCP/IP for DOS,** consists of an Ethernet interface board and software that implements the full suite of TCP/IP protocols, including Telnet and File Transfer Program.

With Netall, users can si-

(continued on page 28)

FEP for Amdahl's Unix mainframes


Up to 64 ASCII devices
Multidrop serial line
Terminal controller
Up to 8 ASCII devices (per controller)
Amdahl Corp. UTS mainframe
Locally attached Ethernet
4.5M byte/sec channel link
Jupiter Technology UniPath/9770 UTS Network Controller
Up to 64 ASCII devices
Up to 64 ASCII devices

Each of the four 2.5M bit/sec serial interfaces can support eight terminal controllers, each of which can support eight ASCII devices.

GRAPHIC BY SUSAN SLATER

SOURCE: JUPITER TECHNOLOGY, INC., PHOENIX

Jupiter introduces FEP for Amdahl Unix mainframes

Supports up to 256 ASCII devices or 6 Ethernets.

By Tom Smith
New Products Editor

PHOENIX — Jupiter Technology, Inc. recently introduced a front-end processor for Amdahl Corp. mainframes running UTS, Amdahl's version of the Unix operating system.

The product, UniPath/9770 UTS Network Controller, supports up to 256 ASCII devices and can alternatively support up to six Ethernet local-area networks.

The front end comes in a package with eight-port terminal controllers and is the same hardware configuration offered by Jupiter for IBM and plug-compatible mainframes. The company has added support for UTS to the front-end processor.

UniPath/9770 is attached to a 4.5M byte/sec mainframe channel.

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UniPath/9770 supports more than double the number of ASCII devices supported by the discontinued 4705E Communications Processors, which Amdahl now reconditions and sells for its Unix mainframes.

The 4705Es support 96 devices when attached to terminal controllers or 32 without terminal controllers, according to Tom Littauer, UTS product manager for Amdahl in Santa Clara, Calif.

The 4705E supports only ASCII terminal connections and not Ethernet links.

UniPath/9770, which is based on Intel Corp. 80286 and 80186 processors, is attached to a 4.5M byte/sec mainframe channel, according to Maurice Voce, director of marketing at Jupiter, an Intel subsidiary.

The front end, which runs its own control software, communicates with UTS device drivers in the mainframe, such as drivers for Ethernets and ASCII terminals, similar to the way in which IBM's Network Control Program running on front-end processors communicates with VTAM.

Because the front end relies on the UTS device drivers in the Amdahl mainframe, it cannot route requests to another front-end processor without first interacting with the mainframe.

A single UniPath/9770, which has six expansion slots, can support up to four multidrop serial communications lines to terminal controllers, with each line transmitting data at 2.5M bit/sec using Jupiter's proprietary token-passing scheme.

An additional slot is taken by a processor board needed for serial line interfaces. That board handles data between the serial interfaces and the front-end processor's main CPU.

Each multidrop line supports up to eight terminal controllers, which have eight RS-232 ports for ASCII terminals and are included in the cost of UniPath/9770. The terminal controllers can be located 1,000 feet from the front end or, using fiber repeaters, up to 1.55 miles. Each serial line interface in UniPath/9770 thus supports up to 64 ASCII terminals or printers.

(continued on page 28)

Processor emulates mix of net devices

IBM-compatible processor can be programmed to function as device best suited to application.

By Tom Smith
New Products Editor

BEAVERTON, Ore. — Polaris Communications, Inc. recently introduced an IBM-compatible communications processor that can emulate a variety of control units and other devices for communications with mainframes.

The System 2000 will attach a variety of devices to a host, including Ethernet and token-ring local-area networks, as well as IBM 3270 terminals, printers and tape drives.

Based on an IBM Personal Computer AT, the new System 2000 offers advantages over other products, such as IBM terminal controllers, because it can be programmed to emulate the device best suited to a particular application, rather than emulating only a terminal controller, according to Polaris.

The System 2000 comes in two versions: the System 2200, which is based on an Intel Corp. 80286 microprocessor and provides five expansion slots for communications cards, and the 80386-based System 2300, which offers 11 expansion slots.

Most mainframe communications controllers emulate an IBM terminal controller only, which is a PU Type 2 device, according to Leslie Trim, vice-president of marketing and sales at Polaris.

However, System 2000 controllers are able to emulate multiple types of control units and devices, such as magnetic tape drives or controllers, printers and channel-to-channel adapters, which provide channel attachments between mainframes for high-speed file transfers.

For terminal-type traffic, the System 2000 emulates an IBM PU Type 2, which provides sufficient performance. But if a user wants to transfer large files, the speeds supported by IBM terminal controllers would not be adequate, Trim said.

By emulating a magnetic tape drive or channel-to-channel adapter, the System 2000 can support mainframe channel speeds and is, therefore, better suited for users that need to transfer large files. The System 2000 supports channel speeds up to 6M byte/sec for hosts such as Hitachi, Ltd. mainframes that exceed IBM channel speeds.

(continued on page 28)

Isicad's new pack helps users monitor net layout

ANAHEIM, Calif. — Isicad, Inc. recently introduced software that enables users to maintain a network configuration data base and generate work orders to change that configuration.

Communications Management and Design (COMMAND) 2000 is software that resides on a stand-alone IBM Personal Computer AT and utilizes the graphics capabilities of Isicad's Cadvance computer-aided design software.

The software provides users with a graphical representation of the network layout and enables users to key in on any one node to obtain further details.

dBase support

COMMAND 2000 gives users the ability to read and write Ashton-Tate Corp. Dbase-compatible files containing information on telecommunications and data communications nets. Cadvance also supported Dbase files but only for CAD files, not those dealing with network connections.

As symbols such as personal computers are entered into the network map, data related to the symbol will be added to the data base. For example, a symbol might represent a Compaq Computer Corp. microcomputer valued at $5,000.

The data base entry for that particular piece of equipment can then be customized with information such as the person using the personal computer and the local-area network on which it resides.

COMMAND 2000 also generates work orders that inform appropriate staff members of needs such as adding a new workstation to the LAN. The work order will include pertinent information such as the user's name and location, and the LAN to which the workstation will be attached.

COMMAND 2000 can also be used to assist a net manager in troubleshooting a problem on the

(continued on page 28)

First Look

continued from page 27

multaneously access a number of computers, including a Digital Equipment Corp. VAX, Sun Microsystems, Inc. workstation, Unix/Xenix host and IBM mainframes.

Netall TCP/IP for DOS costs $229 and is available now.

Xinetron, Inc., 2330 B Walsh Ave., Santa Clara, Calif. 95051; (408) 727-5509.

Aspect ACD enhanced to support more agents, lines

Aspect Telecommunications, Inc. recently enhanced its Aspect CallCenter automatic call distributor (ACD) to support a greater number of agents and trunk lines.

The **System 500R** now supports as many as 400 agents and 552 telephone trunks, compared to the previous high-end System 400R, which supported a maximum of 304 agents and 408 trunks.

In addition, the company increased the number of supervisory terminal ports from 24 to 32 and doubled the voice ports from 32 to 64. Supervisory terminal ports support management consoles for functions such as adding and deleting agents, and setting up call-processing routines. Voice ports, which connect to telephone trunks, are used for recording announcements or leaving voice mail messages.

The System 500R is also capable of supporting 100,000 busy-hour call completions, compared to 50,000 on the System 400R, and a sustained call-processing rate of 14,000 calls per hour, a 100% increase.

The performance improvements have been achieved by migrating from Motorola, Inc. 68020 to 68030 microprocessors, which are available as field upgrades for previous CallCenter models.

CallCenter ACDs can be linked to all major private branch exchanges, including those from AT&T, Northern Telecom, Inc. and Rolm Co.

The System 500R is available now. Pricing, which ranges from $4,000 to $6,000 per agent, is the same as on earlier models.

Aspect Telecommunications, Inc., 1730 Fox Drive, San Jose, Calif. 95131; (408) 441-2200. ◘

Processor emulates mix of net devices

continued from page 27

The System 2000 supports a variety of third-party network interfaces, including serial, parallel, Ethernet, token-ring and X.25. It also supports 3270 and asynchronous protocols.

Polaris will provide users with a list of interfaces that have been qualified for use in the System 2000 bus slots, Trim said. Because of the variety of interfaces that will be offered, the maximum number of devices and networks that can be supported by the System 2000 will vary depending on user configuration.

The wide-area network communications speeds supported by the System 2000 will also depend on the speeds supported by the individual interfaces.

Pricing for a System 2200 begins at $8,000, which includes the personal computer, an interface to the mainframe channel and a single interface such as a serial interface.

Pricing for the System 2300 begins at $12,500, which includes the personal computer, the mainframe channel interface and a serial interface.

Both members of the System 2000 family are available now.

For more information, contact Polaris at 8219 S.W. Cirrus Drive, Building 17, Beaverton, Ore. 97005, or call (503) 643-1533. ◘

Isicad's pack helps users monitor layout

continued from page 27

network. If a LAN node goes down, for example, the net manager can type in the name of the person using that node, upon which the network map generated by the software's CAD component appears on screen. The net manager can view a map depicting the line connection to the node, as well as other information. With Cadvance, users could depict the various LAN nodes, but they were unable to illustrate the physical links between those points.

The software is available now and costs $12,950. It requires the full 640K bytes of memory.

Isicad can be reached in writing at 1920 W. Corporate Way, P.O. Box 61022, Anaheim, Calif. 92803, or by calling (714) 533-8910. ◘

Jupiter intros FEP for Unix mainframes

continued from page 27

The sixth slot in the UniPath/9770 can house an Ethernet interface. Alternatively, users can place Ethernet cards in all six slots since the processor for serial interfaces is not required to support Ethernets.

The UniPath/9770 is available now.

Pricing ranges from $39,000 for a configuration with a single serial interface to $120,000 for a configuration with four serial interfaces. For a 256-ASCII port configuration, the cost per port is $465.

An Ethernet interface costs $6,000; users must also purchase Ethernet software drivers for the mainframe. Those drivers cost $10,000 and can support any number of Ethernet interfaces. A fiber repeater costs $1,800.

Jupiter can be reached by writing to 2402 W. Beardsley Road, Phoenix, Ariz. 85027, or by calling (602) 869-3778. ◘

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Klaus Gueldenpfennig, President
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David Holland, Senior Vice President
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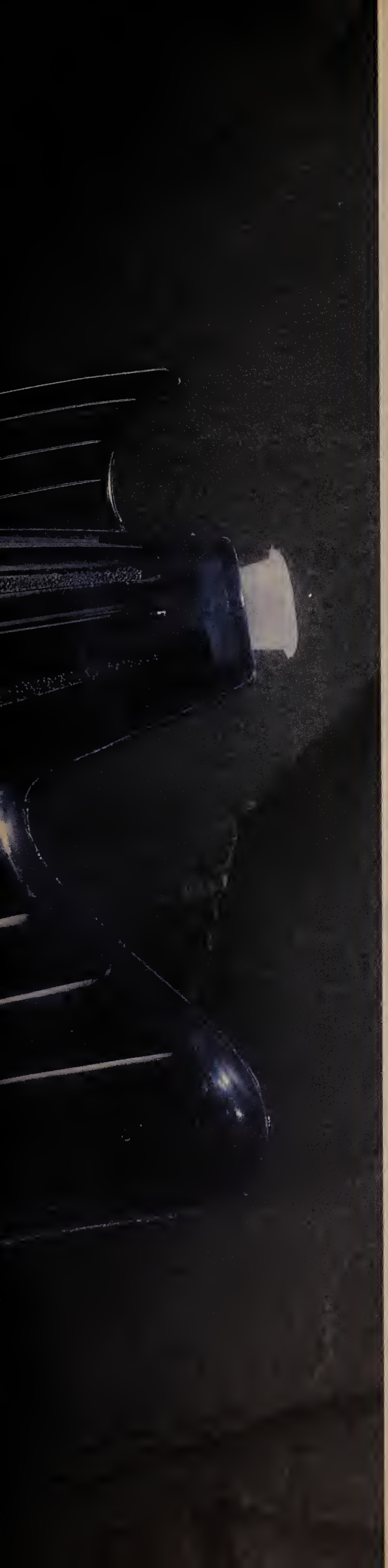

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LEGAL ISSUES

BY E. KENNETH SNYDER

A user lesson in getting what you're entitled to

When buying data communications equipment and software — whether off-the-shelf packages from distributors or turnkey integrated systems from vendors — users should be aware of the legal principles that control purchases and sales.

In legal terminology, the courts classify hardware and software as "goods," placing them in a realm controlled by certain basic principles of commercial law. All sales of goods by "merchants" — parties that deal in particular goods as their business — are covered by an unstated or implied warranty that the goods are "merchantable," that is, fit for their ordinary purpose and in conformity with any statements made on the packages, labels or sales materials that accompany them. Sales by parties that don't deal in the specific goods as their business — for example, private or garage sales — are sales "as is," meaning without a warranty, unless stated otherwise.

The fine print in the warranty or in other sale documents can limit the user's rights.

▲▲▲

Every affirmative factual statement, either oral or in writing, that the seller makes concerning the goods creates an additional explicit warranty that the goods must live up to. For example, if the seller knows the particular purpose the user has for the goods and knows that the user is relying on the seller's skill or judgment to select or furnish suitable goods, then an implied warranty exists that the goods will fulfill the particular purpose the user has for them.

Usually, when a warranty is violated, breach of contract occurs, entitling the buyer to substitute goods that measure up to the terms of the contract. The seller would then be responsible for a refund of the original product's purchase price, the cost of the substituted product and the costs of incidental expenses such as transportation and storage costs.

In such an instance, the buyer is also entitled to consequential damages, which include compensation for the adverse consequences of the seller's breach of contract — for example, loss of business, cost of extra personnel, consulting expenses and costs of reconstructing lost records.

Unfortunately, sellers are permitted to nullify or modify any of these basic warranties. For example, the seller can state in writing that the goods are not merchantable, but are sold as is or guaranteed only as specified in writing. The law also gives the seller the option to allow the user to inspect the goods prior to finalizing the sale, which nullifies any warranty with respect to a problem with the goods the user later discovers.

In this case, the user's rights are limited to return of the goods and repayment of the purchase price, or to replacement or repair of the system or components. This limitation can itself be limited as to the number of times or the length of time for which the limited warranty will be available.

The fine print in the warranty or in other sale documents can limit the user's rights, in which case the user is not entitled to replace the system at the seller's expense with a system that works as desired or to charge the seller with incidental expenses and consequential damages to the user's business. In fact, the user may have no recourse at all if the equipment or software is not actually defective but simply not interoperable.

When buying communications equipment, users must be aware that the broad avenues of legal recourse they would usually enjoy in a commercial sales transaction can be severely limited. Users should shop for the terms of the sale as well as for the system capabilities being purchased. ☐

Snyder is a Seattle-based attorney.

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EDITORIAL

The government should work quickly on setting up NREN

The government is weighing plans to build a high-speed data network that would enable researchers at universities, corporations and government agencies across the U.S. to exchange information and share supercomputer resources.

We strongly urge Congress and the administration to make the plan a reality.

The proposed National Research and Education Network (NREN), which would operate at gigabit speeds, carries a high price tag; estimates are that it could run as high as $400 million. Already, the National Science Foundation has authorized a $15 million expenditure to come up with design options for the NREN, proponents of which include Sen. Albert Gore (D-Tenn.) and the president's Office of Science and Technology Policy. Private companies have also committed significant funding for the project.

Support for the network project may be hard to come by as both Congress and the White House wrestle with the deficit, spending cutbacks and the very real possibility of new taxes.

What's more, there seems to be a growing wariness among legislators and the public for such efforts.

For example, the National Aeronautics and Space Administration faces increasing congressional scrutiny of its proposed space station project and other efforts in the wake of highly publicized problems with the Hubble space telescope and the recent grounding of the space shuttle fleet.

But NREN could provide a real competitive advantage for the U.S. — a way for the nation to leverage the impressive technologies it has developed for the benefit of government and private industry. It could expand upon the innumerable benefits provided by existing research networks, such as the Internet, that have proved invaluable to researchers and others.

Some argue that the government has no business getting into such projects, that such initiatives are best left to the private sector.

But the NREN project favors no industry or philosophy, and it fits into the federal government's responsibility to provide the infrastructure needed for the smooth operation of national commerce.

In a sense, it is akin to the national highway system: As the web of superhighways ensures the smooth flow of goods and people, so would NREN ensure the flow of ideas and information around the country.

Clearly, the proposed network makes sense at a time when political and industry forces abroad — especially in Europe and Japan — are working hand in hand on technological initiatives designed to boost their economic power. ☐

EMERGING TECHNOLOGIES

BY MARY JOHNSTON-TURNER

Wireless technologies could impact users' future nets

It's time for users to start tracking wireless communications technologies and develop a wireless strategy. Except for very small aperture terminals, which competed with long-haul private lines, the wireless stars of the 1980s created new markets by giving users greater mobility than ever before.

In the 1990s, wireless technologies will continue to seek new markets. However, this time, the target may be the terrestrial local loop. If so, telecommunications managers everywhere will have to start thinking about wireless services as more than niche solutions.

Consider some of the most active wireless development projects:

- **Digital cellular.** This new generation of cellular technology will ultimately provide 10 to 20 times the capacity of existing cellular frequencies. Potentially, the cost of cellular calls could approach that of terrestrial calls, but with greater convenience.

However, the telephones will be heavier and more expensive than existing analog cellular phones, at least for a few years. And the carriers may be unable to lower prices rapidly due to the heavy debt incurred while developing the market.

- **Second- and third-generation cordless telephones.** Using different frequencies and lower transmission power requirements than cellular phones, these systems — often referred to as CT2 and CT3 or personal communications networks — are touted as being able to bring personal communications' mobility to everyone.

CT2, currently being demonstrated as a replacement for pay phones in the U.K., allows a user with a low-power personal phone to initiate calls from a limited radius around a public phone kiosk. CT3 provides full two-way communications that mimics cellular more closely for less cost.

Unfortunately, neither CT2 nor CT3 is likely to be appropriate for automotive users due to technical constraints.

- **Digital packet radio.** With limited bandwidth and fragmented geographic coverage, digital packet radio may not be for everyone. However, if a major player underwrites a national system, the technology could provide a cost-effective alternative to dial-up transaction processing, such as that used for credit cards and automated teller machine transactions.

Cellular carriers may explore digital packet radio within the existing cellular frequencies — one quick way of building a national infrastructure.

- **Wireless private branch exchanges and local-area networks.** Using the unregulated frequencies defined in Part 15 of the Federal Communications Commission rules, vendors may introduce wireless premises systems.

For older office buildings that don't have dropped ceilings, raised floors or other acceptable cable conduits, wireless customer premises equipment could be a lifesaver.

- **Vertical Blanking Interval and frequency-modulation subcarriers.** One-way data distribution systems that ride the sidebands of television and radio broadcasts have existed for some time. They may get a new lease on life as distributed on-site processing makes the one-way transmittal of data more valuable.

Other new ventures will not so much compete with terrestrial services as create or expand existing ones:

- **Global cellular networks.** Iridium, a 77-low orbit-satellite network planned by Motorola, Inc., will provide digital switched cellular communications around the world. Scheduled for 1994 availability, this type of system could change the way people think about global communications.
- **Mobile satellite systems.** Low-cost, 6-in. satellite terminals to support truck, train and airplane location, dispatch, pipeline telemetry and transaction processing are poised to take off. Some industry watchers forecast that upwards of two million terminals will be in use by 1995.
- **Next-generation VSATs.** These dishes, less than one meter in diameter, will be capable of higher data rates — in the T-1 range — at a much lower capital cost. Paired with shared hub stations, VSATs are now more affordable than ever.

In the future, wireless technology may encompass light modulation, with infrared replacing short-haul microwave and fluctuations in florescent lights carrying data transmission throughout a building.

Whatever the industry or application requirement, telecommunications managers should realize that wireless is soon going to be much more than a luxury service for a few executives.

For each user's organization, the economics of wireless vs. terrestrial and the timetable for implementing new systems will vary. Many of the wireless options mentioned above are still far in the future, while others are only one to three years ahead.

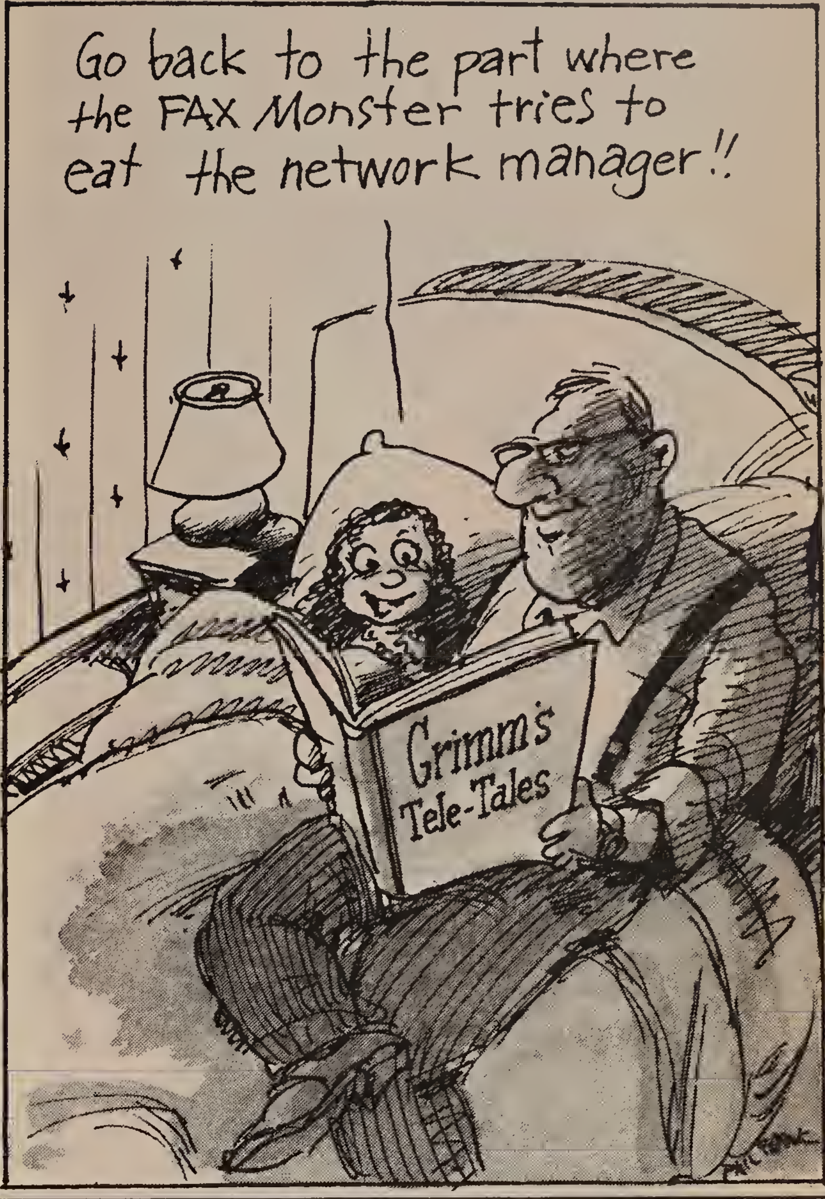
For most of these systems, the first user may get some significant pricing concessions and extra technical support in exchange for serving as a proving ground and development partner. Checking the field may elicit some interesting new proposals from traditional land-line carriers that are worried about losing business.

Now is the time for network managers to assess how well their current and planned applications will dovetail with wireless capabilities and availabilities. ◼

Johnston-Turner is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting collaborative providing strategic planning, technology assessment and training on computers and communications.

TELETOONS

BY FRANK AND TROISE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Grimm's Tele-Tales

LETTERS

An appeal to the intellect

Dean Wolf's recent commentary ("Outsourcing: Everything old is new again," *NW,* June 4) was refreshing.

As Wolf notes, data processing outsourcing has been around in some form for as long as there has been a processing device in the hands of an entrepreneur. Prior to the 1950s, they were called service bureaus, with some offering facilities management services. Ross Perot of EDS Corp. became a legend by running data centers for health insurance companies in the 1960s.

Outsourcing is now, and always has been, an option to be considered on its merits for an individual enterprise. But it will never be the generic solution to all MIS problems, a point most writers overlook. Outsourcing may be chic, but it's not always good business.

Earl Gates
Director of technical
support services
Illinois Power
Decatur, Ill.

Acronym club

I always read the "Worth Noting" snippets, and I usually find them worthwhile. The one by Jack Freeman (*NW,* May 21) was no exception.

What intrigued me most was the explanation that JAFRE, Freeman's organization, stood for Joint Action Frequently Raises Entropy. I guess it can, but I suspect he is a defrocked mechanical engineer who is putting us on, and it really means John A. Freeman Research Associates or something similar.

Readers who have had enough of this initial nonsense are invited to start a local chapter of my own group, the Committee Against Cute Acronyms (CACA).

Raymond DeMers
Operations manager of data/
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Voice messaging goes public

CONTINUED FROM PAGE 1

number of alternative local-access providers that offer point-to-point transport of calls and very few enhanced services. The RBHCs and interexchange carriers also benefit because voice messaging allows for more efficient network utilization: Calls can be completed on the first attempt, reducing the overall number of retrials and freeing network capacity.

Why go with a carrier?

For users, the reasons for having the local or long-distance carrier provide voice-messaging services, instead of buying equipment, are remarkably similar to the reasons firms choose Centrex service over an on-site private branch exchange. Despite the falling prices of voice-messaging systems, the costs involved in buying a piece of voice-messaging equipment to complement an in-house telephone system can still be enormous.

Some of the more involved systems are particularly expensive. One example is interactive voice-message technology, which is an applications-driven, customized service in which the user selects the features and functions required and the carrier configures the system.

Another reason why companies use network-based services is to get a feel for voice mail before investing in premises-based equipment. By signing up for an interexchange carrier or RBHC offering for one year, users can work out any problems involved in implementing their own voice mail system and refine their needs analysis.

In addition, some carriers sell voice mail systems that are similar to the equipment they use in their voice-messaging services. Thus, users setting up an in-house system can get the same equipment and features they received from the carrier during the trial period.

Also, with a carrier-based system, users can avoid many administrative and maintenance costs. Most in-house voice mail systems require a trained technician; administration of large systems can require one dedicated support person for every thousand users.

Carrier-based services come with a broad level of carrier-provided administrative support that can substantially reduce user maintenance time. In addition, carrier operations centers monitor all user companies' equipment on a round-the-clock basis.

Because the local telephone companies and interexchange carriers constantly upgrade their

Briere is president of TeleChoice, Inc., a Manchester, Conn.-based consulting firm specializing in long-distance competitive analysis and network design. He can be reached at (203) 645-0471. Walton is president of Walton and Walton Associates, Inc., a communications consulting firm in Richmond, Va.

systems to serve the needs of the market, users don't have to shoulder the expense of buying new equipment and software upgrades. The interexchange carriers and RBHCs bear the costs of obsolescence.

In addition, carriers offer a higher degree of service oversight and support than most users can provide. Where many voice mail system owners keep spare cards in case of emergencies, many carriers have entire redundant systems.

System expansion and feature upgrades are other areas to consider. Many carrier systems can handle most upgrade requests quickly and without any equipment reconfigurations. However, adding features or capacity to premises-based systems can sometimes cost a great deal.

While in many instances it involves simply adding a few cards to the system, adding capacity above the present rated storage threshold can be fairly expensive. Most systems have a limited amount of slots for cards — often as few as eight. Above that number, a new system or unit has to be purchased.

Users working in an atmosphere characterized by a lot of acquisitions and divestitures could go crazy trying to keep up with changing telecommunications requirements. That's why the carriers invented virtual networks and Centrex service: to allow companies to grow and shrink quickly. Public network-based voice mail systems can add thousands of mailboxes almost overnight, depending upon usage, carrier capabilities and the services used.

Net-based solutions, however, are not for everyone. Among the drawbacks of not having equipment on-site are:

- **Tax and accounting benefits.** Voice-messaging service provided by the interexchange carrier or RBHC will be an expense from an accounting perspective. New equipment, however, can be written off as a capital expense, and the depreciation can often be used to one's advantage.
- **Flexibility.** By opting for a network alternative, users may miss out on some customized applications. A prime example is the interaction between voice-messaging and automatic call distribution systems, as well as interactions between the voice-messaging systems and the on-site host computer for interactive voice processing.
- **Unique demands.** Customers may have such unique requirements that the only true alternative is an on-site voice-messaging system that the user can program and design.
- **Open-systems development.** Some equipment manu-

(continued on page 50)

> Carriers' voice-messaging services are set to give premises-based systems a run for their money.

CHART • GUIDE

A *Network World* Buyer's Guide chart comparing the features and prices of RBHC and interexchange carrier voice-messaging services begins on page 46.

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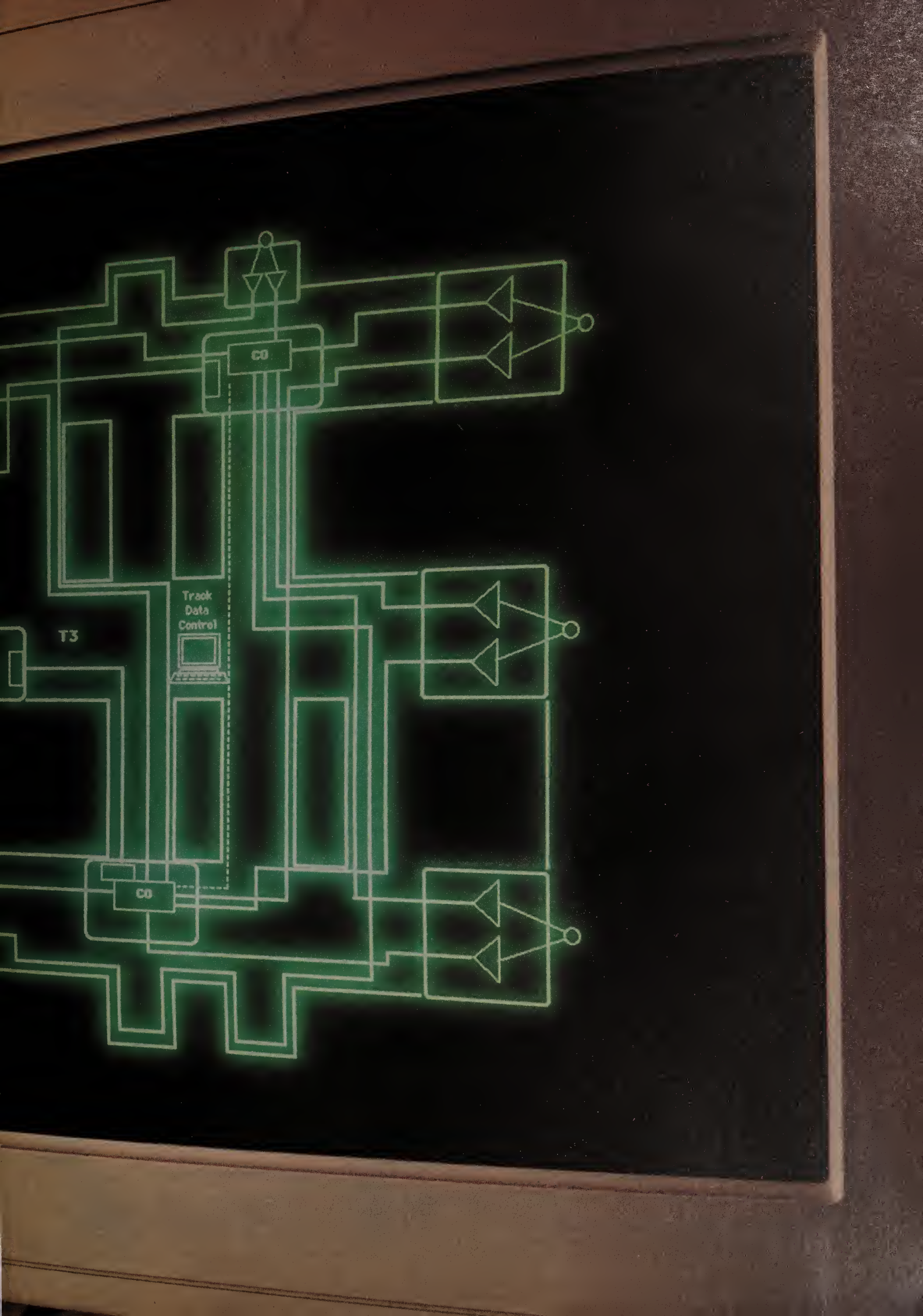
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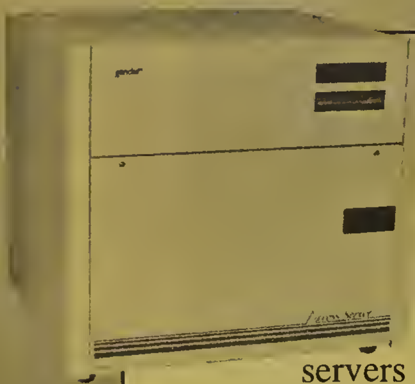

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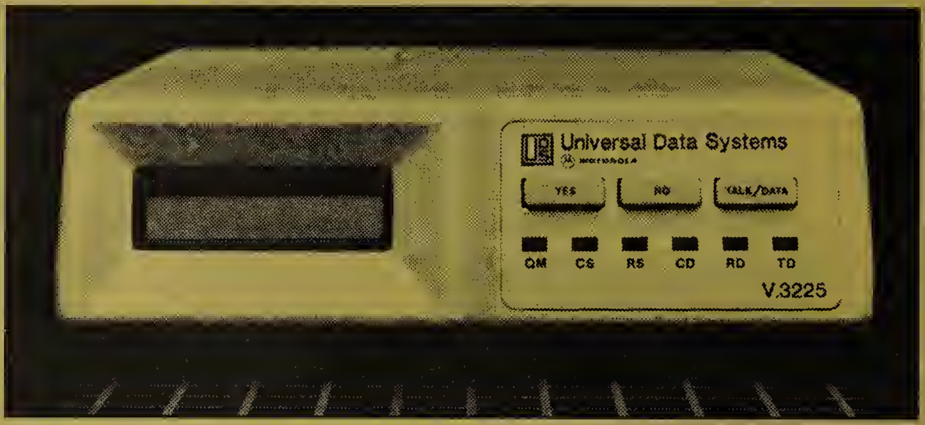

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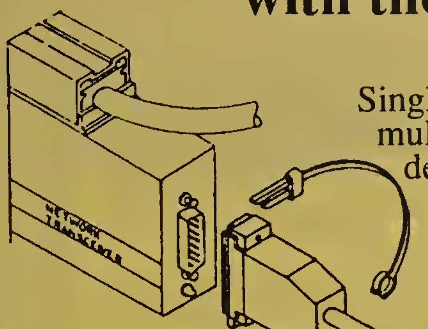

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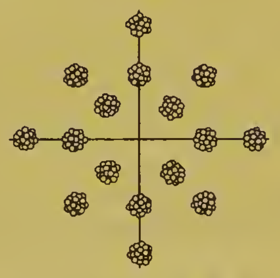

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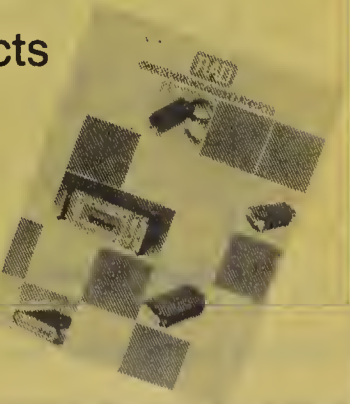


RAD Data Communications, Inc.

151 W. Passaic St.
Rochelle Park, NJ 07662
TEL: (201) 587-8822
FAX: (201) 587-8847

7711 Center Ave., Ste 600
Huntington Beach, CA 92647
TEL: (800) 969-4RAD
FAX: (714) 891-7788

Circle Reader Service No. 21

MODEM

The Top End for Your Bottom Line

Gandalf Introduces the LH19K Modem!

At any distance, the LH19K Modem offers exceptional features and fast transmission (19.2 Kbps) backed by proven technology from Gandalf, a market leader in data communications products and information systems.

The LH19K will reduce your costs by decreasing the number of leased lines and the amount of transmission equipment needed by providing dual channel capability. Asynchronous and synchronous operation and controlled carrier support operation are also included in the many features of the LH19K Modem-- the best value available in the market!

Gandalfs responsive customer service and technical support provide additional value to our products and are committed to your network running with maximum efficiency. The LH19K Modem and Gandalf Data Inc.— the top end for your bottom line.

For more information or to have a salesperson contact you, call 1-800-GANDALF.

gandalf

Circle Reader Service

NETWORK SCANNING AND MONITORING

Cable Scanner

Pinpoint Network Cable Faults Fast!

The Scanner is a monitor, fault finder, cable locator and much more. Helps you pinpoint the location of shorts, opens or breaks. Its 32 character display reports the fault in plain English "short at 306 ft". With an oscilloscope, Scanner's high speed, pulse generating circuitry gives a detailed view of the entire LAN including transceiver, terminator and multiple faults.

- * Cable length measurements
- * Locate breaks, shorts, opens, bad crimps, etc.
- * LAN activity monitoring
- * Find cables in ceilings, walls, floors
- * Cable TV troubleshooting
- * Generate as-built drawings and specifications
- * Isolate faulty network interface cards
- * Very simple to operate

Included is Tracer for locating exactly where in the floor, ceiling, wall or patch panel the cable lies. Cable Scanner, Tracer and Operators' Manual are only $1495.

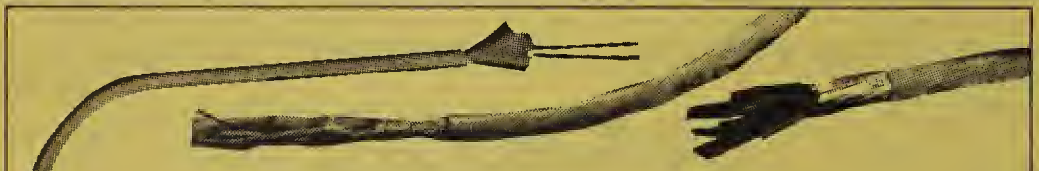
M-Test Equipment
P.O. Box 460008
San Francisco, CA 94146-0008

Call for info

Outside CA: (800) 334-4293
Inside CA: (415) 861-2382
FAX: (415) 864-1076

Circle Reader Service No. 10

NETWORK CABLE



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Belden's newest plenum cable has a jacketing innovation called Flamarrest.™ Better yet, Wise Components has it in stock for immediate delivery.

Costing less than cable with a traditional fluorocopolymer jacket, it's five times more flexible. Flamarrest lies flat, weighs less, is easy to strip and simple to terminate.

Most important, Flamarrest is IBM/ETL-approved along with being UL/NEC-rated. And it comes in over 30 types, including coaxial, multi-pair, multi-conductor and fiber optic cables.

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WISE COMPONENTS, INC.

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COOPER INDUSTRIES BELDEN

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A PC-based protocol analyzer that's serious about portability.

The LM1® is a PC-based protocol analyzer with a lot of get up and go. In a laptop, it weighs less than 15 pounds. You get maximum portability so you can zero in on problems in the shop or in the field. The remote option lets you monitor off-site lines, and captured data can be analyzed on any PC.

The LM1 gives you in-depth plain English decodes, BERT/BLERT testing, time stamping, and interactive simulation.

We're serious about performance and portability. Call us at (708) 574-3399.

Progressive Computing

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(708) 574-3399 FAX (708) 574-3703

Circle Reader Service No. 9

LM1 is a registered trademark of Progressive Computing, Inc.

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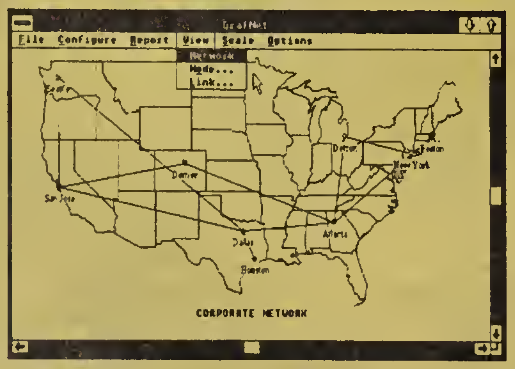
GrafNet provides instant visual displays of network topologies...

PC Software allows easy viewing of network configurations.

FEATURES:

- * Built-in database automatically converts Area code/Prefix to an on screen geographical location.
- * Add and delete lines and nodes through our friendly Microsoft Windows interface.
- * View topology nation-wide or on a state by state basis.
- * Zoom in on a geographical area for closer viewing.
- * Print and plot to any device supported by Microsoft Windows.



$450
FREE DEMO DISK

Call today for more information: (408) 446-9598

Network Dimensions, Inc. 5339 Prospect Road, Suite 122, San Jose, CA 95129

Circle Reader Service No. 8

Send For Free Info

NW July 90

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Complete the coupon information and mail to:
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P.O. Box 5090, Pittsfield, MA 01203

Expires 10/31/90

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Title ______________________
Company ______________________
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Street ______________________
City ______________________
State ____________ Zip ____________

1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33
34 35 36 37 38 39 40 41
42 43 44 45 46 47 48 49
50 51 52 53 54 55 56 57

NW July 90

PROTOCOL ANALYZER

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PC Based Protocol Analyzer

$495

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- Async, Sync, BOP's (SDLC, X.25, etc.), Transparent, ASCII, EBCDIC, IPARS, user defined.
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Circle Reader Service No. 11

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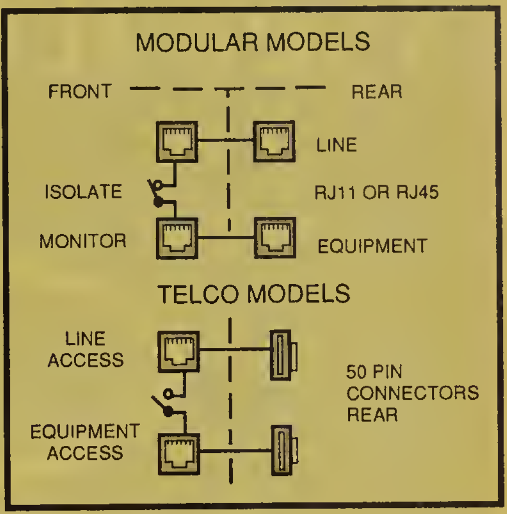
LINE - EQUIPMENT - MONITOR

Dataprobe's New MOD*FIELDS provide patching for up to 24 eight wire circuits in only 3.5" of rack space.



Normal through connections for VF, T1, RS-232, LANs with dual monitor and test access.

Pushbutton isolation for circuit patching and cross connects using modular cords.
Less than $30 per circuit.

Rear Connections either 50 pin Telco or modular.

dataprobe INC.

ASK FOR 150 INTERCONNECT IDEAS CATALOG
PHONE: (201) 569-6464 FAX: (201) 894-0939

Circle Reader Service No. 13

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$420

MADE IN USA

Turn Your PC Into A Low Cost Data Line Monitor

MODEL 902 PC COMSCOPE

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- * ASYNC/BISYNC
- * STORE DATA ON DISK
- * HDLC/SDLC
- * TRAP ON ANY 15 EVENTS
- * TIME STAMPING

Circle Reader Service No. 4

TELEBYTE
TECHNOLOGY, INC.

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Greenlawn, NY 11740-9810

516-423-3232/516-385-8080 * 1-800-835-3298 * FAX: 516-385-8184

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- * 3780
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TIL offers a wide variety of hardware configurations ranging from PC half-cards to a 16 port multi-protocol unit.

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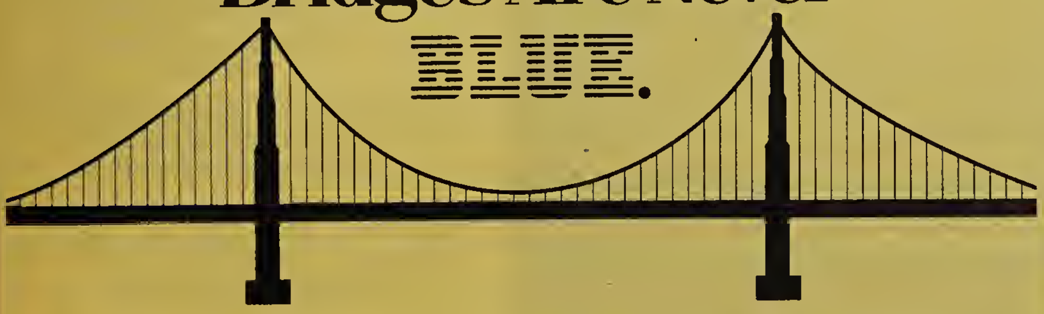
Circle Reader Service No. 14

TIL SYSTEMS INC.

225 Stedman Street
Suite 27,
Lowell, MA 01851
(508) 970-1189

TOKEN RING

Why The Best Bridges Are Never BLUE.



The new Netronix 4/16 Mbps TokenMaster Token Ring bridge is more than just 100% IBM compatible. It's actually built to be a bridge. With a smaller footprint, exclusive error diagnostics, and full security against disk failures and unauthorized keyboard entries. All for a lot less cost than you'd expect. So, take your PCs out of the wiring closet and get a Netronix TokenMaster today. Call **1-800-282-2535** or FAX **1-707-763-6291.** Or write to Netronix, 1372 North McDowell Blvd., Petaluma, CA 94954.

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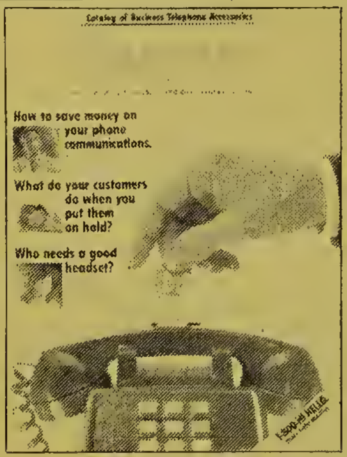
Circle Reader Service No. 12

PHONE ACCESSORIES



Catalog of Business Telephone Accessories

How to save money on your phone communications.

What do your customers do when you put them on hold?

Who needs a good headset?

The Hello Direct Catalog has hundreds of ideas for improving the efficiency and convenience of using your business telephone. Inside this order-direct catalog, you'll find headsets, fax and cellular products, call amplifiers, cost control devices, modular cords and connectors, and much more. Plus you'll enjoy toll-free ordering, knowledgeable sales help, and a risk-free, no hassle guarantee.

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That's 800-444-3556.

HELLO Direct

Circle Reader Service No. 15

1990

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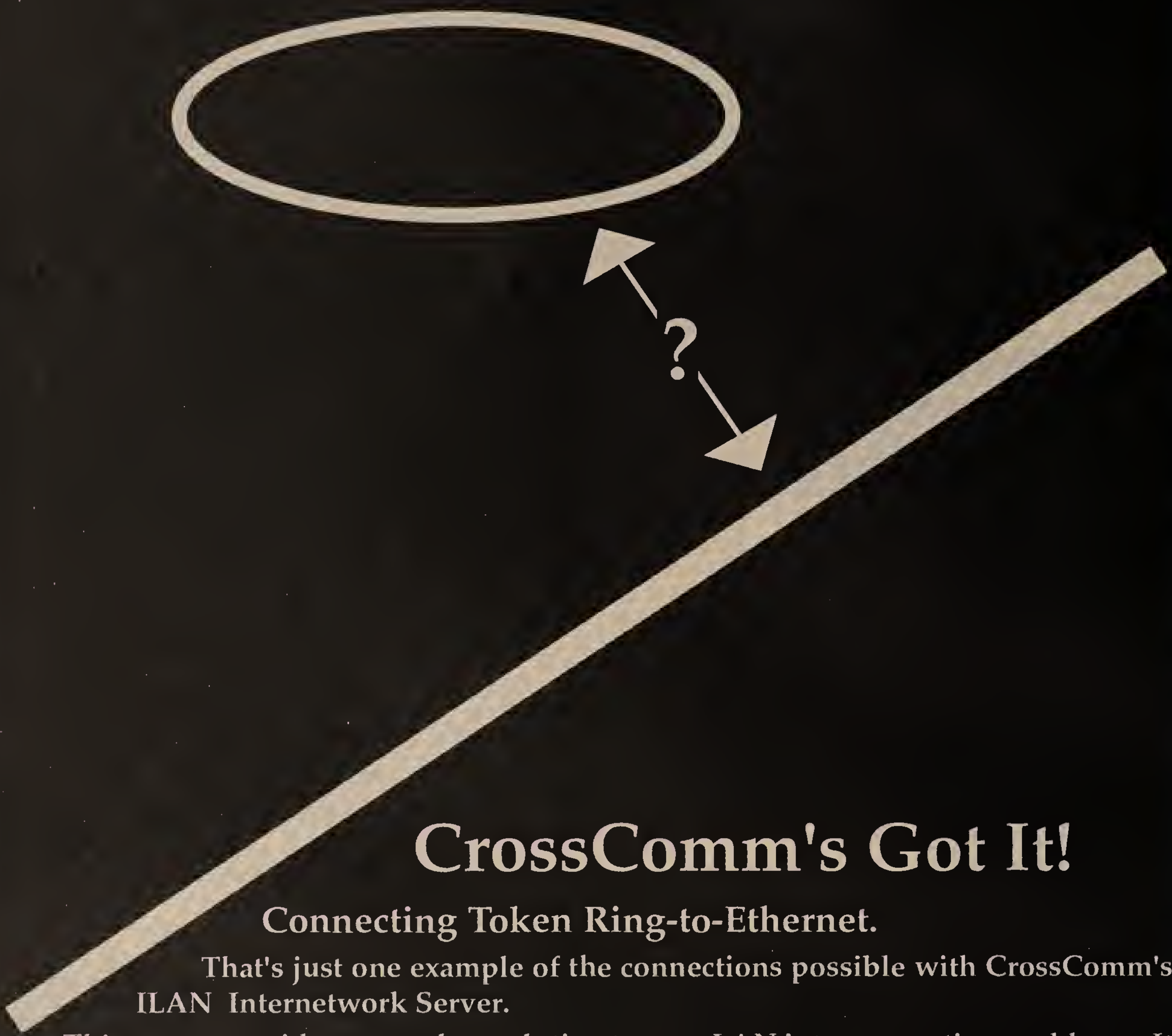
(In MA 508-875-6400)

Pacific & Mountain Time Advertisers
Call Clare O'Brien
800-622-1108 (In MA 508-875-6400)

Get It?



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Connecting Token Ring-to-Ethernet.

That's just one example of the connections possible with CrossComm's ILAN Internetwork Server.

This server provides a complete solution to your LAN interconnection problems. It makes it easy and economical to build enterprise-wide networks. It connects LANs that are similar, dissimilar, local and remote. And it is controlled by a standard network management system.

The ILAN Internetwork Server supports connections between any combinations of Token Rings, Ethernets, T1, Fractional T1, CEPT, 56/64 kbps and EIA 232 networks.

And to keep everything working we offer ExpertWatch, the only one hour response on-line network monitoring service on the market.

CrossComm Corp. 133 East Main Street P.O. Box 699 Marlboro, MA 01752
(800) 388-1200 (508) 481-4060 FAX (508) 481-4216

See The FAXNet Form on Page #18

The following advertisers appear
on the FAXNeT form on page #18:

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That means you'll reach the specialized and qualified applicants you want.

Over 70,000 communications professionals subscribe to *Network World.*

One of them could be exactly who you're looking for!

For information on placing your recruitment ad, call Barbara Hill toll free at **800-343-6474** (In MA) **508-820-2543**.

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It's Easy To Place Your Recruitment Ad In Network World!

All the information you need is right here.

The following information will help you determine the size ad you'd like to run and when you'd like to run it.

RATES:

Lines	$ Per Line
0-699	$8.00
700-1,399	$7.30
1,400-2,799	$7.00
2,800-4,199	$6.65
4,200-5,599	$6.30
5,600-6,999	$6.00
7,000-8,399	$5.65
8,400-18,199	$5.30
18,200-36,399	$5.20
36,400-54,599	$5.10
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72,800 +	$5.00

Your price will depend on the size of your ad. The 1990 1x open line rate is $8.00 per line or $112.00 per column inch.

The mimimum ad size is two column inches (1-1/4'' wide by 2'' deep) and costs $224.00. You can run larger ads in half-inch increments at $56.00 per half column inch.

U.S. box numbers are available and cost $15.00 per insertion.

TAB PAGE DISCOUNT: Tab pages are discounted 10%.

FREQUENCY DISCOUNT: Run your ad twice in four weeks and get the second ad for 1/2 price.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs at the 1x open line rate. (All are at gross cost). 15% agency commission applies.

Tab page	$8,820 ($9,800-10% discount)
1 column x 2''	$224.00
2 columns x 2''	$448.00
3 columns x 3''	$1,008.00
4 columns x 5''	$2,240.00
5 columns x 7''	$3,920.00

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

CAREERS NETWORK BUYS: You can take advantage of special rates that let you run your ad in Network World and Network World's sister newspaper Computerworld at special rates. Call for details.

CLOSING DATES: To reserve space, you need to call us by 5:30 P.M. Eastern Standard Time, 12 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5:30 P.M., 7 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference. There are 1,400 lines to a page.

NUMBER OF COLUMNS	MINIMUM DEPTH	WIDTH
1 column	1-1/4''	2''
2 columns	2-5/8''	2''
3 columns	4-1/16''	3''
4 columns	5-9/16''	4''
5 columns	6-15/16''	5''
6 columns	8-3/8''	6''
7 columns	9-3/4''	7''

For further information:
Please call Barbara Hill at 1-800-622-1108 (or in MA, 508-875-6400)

Or you may send your copy to: Network World, The Meadows,
161 Worcester Road, PO Box 9172, Framingham, MA 01701-9172.

If you wish you can fax your copy to us at 508-879-3167.

NETWORK WORLD RESOURCE DIRECTORY

Network World's Resource Directory is a new service for both our advertisers and our readers. The Resource Directory is updated monthly to be the most comprehensive listing of networking products and services available anywhere. With over two hundred categories to choose from, you can place your company under the most appropriate headings to make it easily accessible for our 75,000 audited buyers.

All rates for listings are sold on a 26-week basis and are net priced for that period. For less than $20. a week, your listing will appear in Network World's Resource Directory every week for a 26-week period, making this opportunity very affordable. A line listing is company name and telephone number.

Display listings are also available in three sizes. A display listing consists of copy of your choice.

Line Listing Rates (prices are net for 26-week period)

Company listing	$500.
2-9 additional listings	$450. per listing
10 or more additional listings	$400. per listing
Bold listing — extra	$ 50. per listing

Display Listing Rates (prices are net for 26-week period)

2 5/16″ wide x 1″ deep	$2,000.
2 5/16″ wide x 1 1/2″ deep	$2,800.
2 5/16″ wide x 2″ deep	$3,600.

Space and copy closing for next updated issue is July 30. Listing begins in August 13 issue and runs through the February 11, 1991 issue.

For more information or the list of headings, call Eleni Brisbois, Resource Directory/Project Manager at 1-800-622-1108 or 508-875-6400.

To place your listing call 1-800-622-1108 or fax 508-879-3167 or mail your order to *Network World*, Eleni Brisbois/Resource Directory, 161 Worcester Road, Framingham, MA 01701-9172.

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RAD Data Communications Inc	201-587-8822

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T-1

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RAD Data Communications Inc	201-587-8822

Network Management Systems

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AT&T Paradyne	813-530-2994
Communication Devices, Inc.	**800-359-8561**
Dynatech Communications	703-550-0011
Micro Technology	714-970-0300

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RAD Data Communications Inc	201-587-8822

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RAD Data Communications Inc	201-587-8822

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Telecom Services Buyer's Guide: Comparison of Carrier Customer Service Organizations

September 24
Network World 5th Annual Budget Survey *Bonus Distribution: TCA*

RBHC and interexchange carrier voice-messaging services (cont'd on page 49)

Company	Product	Product type	Target market	Installation fees	Monthly fees	Usage fees	Monthly minimums	Minimum contract period	Greeting message length	Standard message length	Number of messages	Storage period	Future delivery messages/ future period	Number of group lists/ mailboxes per list
AT&T Basking Ridge, N.J. (800) 862-2588	AT&T InfoWorx	Interactive response	Business, 1+ lines	InfoWorx utilizes AT&T 800 and 900 services; those installation fees apply	InfoWorx utilizes AT&T 800 and 900 services; those monthly fees apply	Per-minute with volume discounts: $.11 to $.16 for $0 to $60,000 of usage, $.08 to $.13 for $60,001 to $300,000, $.05 to $.10 for $300,001 to $1,000,000, $.04 to $.08 for $1,000,000+, all prices negotiable	A nominal minimum monthly charge is assessed to cover development cost of an individual client's application	Generally 1 to 3 years	Varies by application	Varies by application	Varies by application	Varies by application	Not applicable	Not applicable
	AT&T VoiceMark	Message delivery	Residential, business, 1+ lines	$0	$0	Rates per delivered message: $1.75 for U.S. destinations; $2.50 for automated delivery, person to person; $4.50 to $11 for international destinations	None	None	Not applicable	Not applicable	Not applicable	Not applicable	No limit/7 days	Not available
	AT&T Voice Mail	Voice messaging; integrated messaging services with other AT&T customer premises equipment, Centrex facilities, and customer-provided AT&T 800 access	Business, 25+ lines	$10 per mailbox	$8 to $12 per mailbox	Varies by access type (local or 800)	None	1 to 2 years standard; additional options available	3.5 min (5)	3.5 min (5)	60 min	7- or 14-day option	60 min storage (includes inbound and outbound traffic)/1 year	25/250
Bell Atlantic Corp. Philadelphia	Voice Mail (currently under trial)	Telephone answering	2 to 20 lines	$10 to $32, depending on state	$10 per 30-min mailbox, $11 per 45-min box (6)	None	None	Month to month	30 sec	Limited to amount of time purchased	30-min or 45-min options	Until customer erases (11)	Studying as part of present trial	Studying as part of present trial
	AnswerCall	Telephone answering	Residential, small business, 1 line	$5 to $21.06, depending on state	$5 to $8 depending on features of mailbox	None	None	Month to month	30 sec	Limited to amount of time purchased	30-min or 45-min options	Until customer erases (11)	Not available	Not available
BellSouth Corp. Atlanta	Memory-Call — Business Telephone answering service	Telephone Answering Service	Business, 1 to 10 lines	$15 per mailbox (8)	$5.95 to $8.95 per mailbox (8), includes 90 min of usage	$.08 per min over allotment	None	None	45 sec	3 min	30	7 days for new messages; 14 days for archived messages	2/31 days	10/25
	Memory-Call — Residence/ Business Telephone Answering Service Plus	Telephone answering service	Residential, business, 1 to 10 lines	$15 per mailbox (8)	$7.95 to $10.95 per mailbox (8), includes 90 min of usage	$.08/min over allotment	None	None	45 sec	3 min	30	7 days for new messages; 14 days for archived messages	2/31 days	10/25
	Memory-Call — Business Basic Voice Messaging Service	Voice messaging	Business, 7+ lines	$15 per mailbox (8)	$12 per mailbox (8), includes 90 min of usage	$.08/min over allotment	None	None	45 sec	3 min	30	7 days for new messages; 14 days for archived messages	2/31 days	10/25
	Memory-Call — Business Deluxe Voice Messaging Service	Telephone answering service	Business, 200+ lines	$15 per mailbox (8)	$15 to $18 per mailbox (8, 9), includes 90 min of usage	$.08/min over allotment (9)	None	None	45 sec	3 min	30	7 days for new messages; 14 days for archived messages	2/31 days	10/25
Nevada Bell Reno, Nev.	Nevada Bell Voice Mail Series 50	Voice messaging; telephone answering	Business, 1+ lines	$100 per mailbox for Centrex accounts, $15 for others (1)	Standard: $10.95 to $19.95 per mailbox (1), deluxe: $18.95 to $29.95 per mailbox, rates vary depending on volume and term of contract; additional charges for call forwarding and message waiting indicator; $290 to $420 per port for port/storage (includes 90 min of storage)	None	None	Month to month	180 sec	Standard: 3 min deluxe: 6 min	Standard: 30 deluxe: 60	Standard: 14 days deluxe: 30 days	25/365 days	15/25

FOOTNOTES
(1) Contractual prices are available for 10 mailboxes or more.
(2) Installation fees are waived if paging or call transfer is included in initial order.
(3) When service is first introduced in a city, US West offers a special 90-day promotion in which installation fees are waived.
(4) Optional features such as message notification, message send and guest mailbox are priced at $3.50 per month for one feature, $6 for two features, $8 for three and $10 for all four features.
(5) Custom lengths available.
(6) Includes $2 cost for call forwarding.
(7) When service is first introduced in a city, US West offers a special 45-day promotion in which installation fees are waived.
(8) Prices do not include end-user features such as call forwarding-busy line/no answer or message waiting indicator. Typically, call forwarding costs $1 per month for residences and $3.25 per month for each business. Message waiting indicator is $1 per month for residence or businesses.
(9) Volume discounts apply.
(10) Optional service, $1.50 per month for three family mailboxes.
(11) If customer uses up entire monthly minutes allotment, then no new messages will be received.
(12) Telecom*USA's voice-messaging service is a standard feature of its travel card and 800 services. As such, many rates applicable are those of its travel card and 800 service programs.
(13) $15 per group if four or fewer call answer boxes are purchased.

This chart offers a representative sampling of business-oriented voice-messaging services offered by the carriers listed. Other carriers may offer similar services, and the above carriers offer other voice-messaging services. Contact your carrier's local customer service representative for more information.

SOURCE: TELECHOICE, INC., MANCHESTER, CONN.

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RBHC and interexchange carrier voice-messaging services (cont'd on page 50)

Company	Product	Product type	Target market	Installation fees	Monthly fees	Usage fees	Monthly minimums	Minimum contract period	Greeting message length	Standard message length	Number of messages	Storage period	Future delivery messages/ future period	Number of group lists/ mailboxes per list
Nevada Bell	Nevada Bell Voice Mail Series 100	Voice messaging, telephone answering	Business, 1+ lines	$100 per mailbox for Centrex accounts, $15 for others (1)	Flat-rate service: $10.95 to $19.95 per standard mailbox (1); 18.95 to $29.95 per deluxe mailbox; rates vary depending on volume and term of contract; additional charges for call forwarding and message-waiting indicator, $10 per mailbox with usage-sensitive service	Usage-sensitive service: varies	None	Month to month	180 sec	Standard: 3 min, deluxe: 6 min	Standard: 30, deluxe: 60	Standard: 14 days, deluxe: 30 days	25/365 days	15/25
	Nevada Bell Voice Mail Series 200	Voice messaging, telephone answering	Centrex business users, 1+ lines	$100 per mailbox for Centrex accounts; $15 for others (1)	$150 to $200 per port for port/storage, rates vary depending on number of ports, term of contract; storage costs $150 per hour	None	None	Month to month	180 sec	20 sec to 8 min	Up to 999	2 to 365 days	25/365 days	15/25
New England Telephone and Telegraph Co. Boston	Business Call Answering NYNEX Voice Messaging Service	Telephone answering	Business, 1 to 10 lines	$18.43 per line	$12 per line	None	Not applicable	None	30 sec	2 min	40	30 days	Not available	3 guest mailboxes that messages may be sent to
	Large Business Customer NYNEX Voice Messaging Service	Voice messaging, telephone answering, call processing, information mailbox	Business, 200 to 10,000+ lines	$5 per mailbox	$6.30 for standard voice mail, $9.45 for expanded mailbox; $7 for standard call answering, $10.50 for expanded; $3.50 for 1 min call processing, $7 for 3 min; $4 for 1 min information, $7 for 3 min, $12 for 5 min; $150 for port/storage	None	None	3 years	30 sec	Standard: 3 min, expanded: 6 min	Standard: 30, expanded: 60	Standard: 30 days, expanded: 60 days	Standard: 5/30 days, expanded: 10/60 days	Standard: 3/25, expanded: 6/25
New York Telephone Co. New York	Large Business Customer NYNEX Voice Messaging Service	Voice messaging, telephone answering, call processing, information mailbox	Business, 200 to 10,000+ lines	$5 per mailbox	$6.30 for standard voice mail, $9.45 for expanded; $7 for standard call answering, $10.50 for expanded; $3.50 for 1 min call processing, $7 for 3 min; $4 for 1 min information, $7 for 3 min, $12 for 5 min; $150 for port/storage	None	None	3 years	30 sec	Standard: 3 min, expanded: 6 min	Standard: 30, expanded: 60	Standard: 30 days, expanded: 60 days	10/60 days	6/25
	Business Call Answering NYNEX Voice Messaging Service	Telephone answering	Business, 1 to 10 lines	$54.05 per line	$12 per line	None	Not applicable	None	30 sec	2 min	40	30 days	Not available	3 guest mailboxes that messages may be sent to
Pacific Bell San Francisco	Pacific Bell Voice Mail Series 100	Voice messaging, telephone answering	1+ lines	$15 per mailbox (1, 2), $100 per port for port/storage	$10.95 to $19.95 per standard mailbox (1); $18.95 to $29.95 per deluxe mailbox (rates vary depending on volume and term of contract, additional charges for call forwarding and message-waiting indicator); $290 to $420 per port for port/storage (includes 90 min of storage)	None	None	Month to month, 1 year, 3 years, 5 years	120 sec	Standard: 3 min, deluxe: 6 min	Standard: 30, deluxe: 60	Standard: 14 days, deluxe: 30 days	30/365 days	15/25
	Pacific Bell Voice Mail Series 50	Voice messaging, telephone answering	Business, 1+ lines	$15 per mailbox (1, 2) $100 per port for port/storage	$10.95 to $19.95 per standard mailbox (1); $18.95 to $29.95 per deluxe mailbox; rates vary depending on volume and term of contract; additional charges for call forwarding and message-waiting indicator; $290 to $420 per port for port/storage (includes 90 min of storage)	None	None	Month to month, 1 year, 3 years, 5 years	120 sec	Standard: 3 min, deluxe: 6 min	Standard: 30, deluxe. 60	Standard: 14 days, deluxe: 30 days	30/365 days	15/25
	Pacific Bell Voice Mail Series 200	Voice messaging, telephone answering	Centrex Business Users, 1+ lines	$15 per mailbox (1, 2) $100 per port for port/storage	Mailbox: $8.75 to $19.95 (1); rates vary depending on volume and term of contract; additional charges for call forwarding and message-waiting indicator; port/storage: $290 to $420/port (includes 90 min of storage)	None	None	Month to month, 1 year, 3 years, 5 years	120 sec	20 sec to 8 min	Up to 999	2 to 365 days	30/365 days	15/25

FOOTNOTES

(1) Contractual prices are available for 10 mailboxes or more.
(2) Installation fees are waived if paging or call transfer is included in initial order.
(3) When service is first introduced in a city, US West offers a special 90-day promotion in which installation fees are waived.
(4) Optional features such as message notification, message send and guest mailbox are priced at $3.50 per month for one feature, $6 for two features, $8 for three and $10 for all four features.
(5) Custom lengths available.
(6) Includes $2 cost for call forwarding.
(7) When service is first introduced in a city, US West offers a special 45-day promotion in which installation fees are waived.
(8) Prices do not include end-user features such as call forwarding-busy line/no answer or message-waiting indicator. Typically, call forwarding costs $1 per month for residences and $3.25 per month for each business. Message-waiting indicator is $1 per month for residence or businesses.
(9) Volume discounts apply.
(10) Optional service, $1.50 per month for three family mailboxes.
(11) If customer uses up entire monthly minutes allotment, then no new messages will be received.
(12) Telecom*USA's voice-messaging service is a standard feature of its travel card and 800 services. As such, many rates applicable are those of its travel card and 800 service programs.
(13) $15 per group if four or fewer call answer boxes are purchased.

This chart offers a representative sampling of business-oriented voice-messaging services offered by the carriers listed. Other carriers may offer similar services, and the above carriers offer other voice-messaging services. Contact your carrier's local customer service representative for more information.

SOURCE: TELECHOICE, INC., MANCHESTER, CONN.

NETWORK WORLD

RBHC and interexchange carrier voice-messaging services (cont'd from page 49)

Company	Product	Product type	Target market	Installation fees	Monthly fees	Usage fees	Monthly minimums	Minimum contract period	Greeting message length	Standard message length	Number of messages	Storage period	Future delivery messages/ future period	Number of group lists/ mailboxes per list
Southern New England Telephone Co. New Haven, Conn.	Message Taker Service, Options I and II (MTS I and MTS II)	Voice messaging, telephone answering	1 to 2 lines	$15 per mailbox	Option I: $7.95 per mailbox, Option II: $14.95 per mailbox	$.15 per min over: Option I: 60 min, Option II: 120 min	None	None	5 min	5 min	Option I: 25, Option II: 58	14 days	Not available	10/no limit
	SNET Voice Messaging	Voice messaging, telephone answering	1 to 1,000+	$15 per mailbox for 1 to 50 mailboxes, $10 per box for 51 to 200 mailboxes, no charge for 201+ boxes	Option I: $10 per mailbox, Option II: $25 per mailbox	Mailbox: Option I: $.15/min, Option II: none	None	Option I: negotiable, Option II: 1 year	5 min	5 min	58	14 days	No limit/31 days	10/no limit
Southwestern Bell Telephone Co. St. Louis	Business Voice Messaging Service — Basic Service	Voice messaging	7+ lines	$1 per mailbox	$9 to $14 per mailbox, depending on number of mailboxes	None	None	Month to month	30 sec	90 sec	25	5 days	25/30 days	9/25
	Business Voice Messaging Service — Premium Service	Voice messaging, telephone answering	7+ lines	$1 per mailbox	$9 to $20 per mailbox, depending on number of mailboxes and length of contract	None	None	1 year	60 sec	3 min	50	30 days	50/30 days	99/99
Telecom*USA, Inc. Atlanta (800) 476-1234	Voice Messaging (12)	Voice messaging, voice processing, telephone answering	Business, residential, users requiring 2 to 10 mailboxes	$0 per mailbox for internal company communications; $10 for 800 answering services (12)	$2.75 per mailbox (12)	$.29/min access costs	None	Month to month	30 sec	3.5 min	58	14 days	Available 3Q 1990	Not available
US West Communications Denver	US West Small Business Voice Messaging Service	Telephone answering	Small and midsize businesses with 1 to 10 lines	$15 per mailbox (7)	$12.75 per line, $15.50 with call forwarding and message-waiting tone (4)	None	None	Month to month	90 sec	3 min	Standard: 25, with guest mailbox: 40	New messages: 21 days, archived messages: 14 days	1/120 days, only deliverable to another mailbox holder	15/25
	US West Business Voice Messaging Service Call Answer Option	Telephone answering, voice messaging	Large customers, government and education customers; 10+ lines	$10 per mailbox (3, 13)	$12.75 per mailbox	None	None	Month to month	90 sec	3 min	35	New messages: 21 days, archived messages: 14 days	Not available	Not available
	US West Business Voice Messaging Service Voice Mail Option	Telephone answering, voice messaging	Large customers, government and education customers; 10+ lines	$10 per mailbox	$11.50 to $20.75 per mailbox depending on the number of mailboxes and term of plan	None	None	1 year	90 sec	3 min	50	New messages: 21 days, archived messages: 14 days	1/10 days, only deliverable to another mailbox holder	15/25

FOOTNOTES

(1) Contractual prices are available for 10 mailboxes or more.
(2) Installation fees are waived if paging or call transfer is included in initial order.
(3) When service is first introduced in a city, US West offers a special 90-day promotion in which installation fees are waived.
(4) Optional features such as message notification, message send and guest mailbox are priced at $3.50 per month for one feature, $6 for two features, $8 for three and $10 for all four features.
(5) Custom lengths available.
(6) Includes $2 cost for call forwarding.
(7) When service is first introduced in a city, US West offers a special 45-day promotion in which installation fees are waived.
(8) Prices do not include end-user features such as call forwarding-busy line/no answer or message-waiting indicator. Typically, call forwarding costs $1 per month for residences and $3.25 per month for each business. Message-waiting indicator is $1 per month for residence or businesses.
(9) Volume discounts apply.
(10) Optional service, $1.50 per month for three family mailboxes.
(11) If customer uses up entire monthly minutes allotment, then no new messages will be received.
(12) Telecom*USA's voice-messaging service is a standard feature of its travel card and 800 services. As such, many rates applicable are those of its travel card and 800 service programs.
(13) $15 per group if four or fewer call answer boxes are purchased.

This chart offers a representative sampling of business-oriented voice-messaging services offered by the carriers listed. Other carriers may offer similar services, and the above carriers offer other voice-messaging services. Contact your carrier's local customer service representative for more information.

SOURCE: TELECHOICE, INC., MANCHESTER, CONN.

(continued from page 35)

facturers are opening their hardware to third-party software development, creating a new series of applications that will expand the utilization of the core hardware. By opening up the interfaces to third-party development, the base system can be expanded. This means that users might have a greater range of functionality with a premises-based alternative.

Evaluating voice messaging

Some of the network-based vs. premises-based arguments become intangible when it comes to voice messaging. Many companies tend to focus more on technology when the equipment is on-site; with network-based services, managers concentrate more on the applications involved. This is because there is a whole crew of carrier personnel assigned to deal with hard-core technical issues.

In fact, some voice-messaging service providers claim that service support is one of the major differentiating factors in favor of the public network-based solution. AT&T, for instance, has a service support manager specifically assigned to promoting the usage of its installed voice-messaging systems and developing new applications for customers.

Indeed, public network-based alternatives offer more of a one-stop shop for managers who want to have a great deal of work taken off their hands. By off-loading some of the hands-on work to the carriers, network managers can concentrate on more strategic issues.

Defining voice messaging

The two most familiar applications of voice messaging are call answering and voice mail. With call answering, the caller is routed to a voice mailbox whenever the dialed line is busy or unanswered. With voice mail, the system is independent of the subscriber's telephone facilities — the caller directly enters the voice mail system via an outside line, typically an 800 number. Some services and systems combine the two applications (see graphic, page 51).

However, as technology has grown and companies have become accustomed to voice messaging, more intense applications have arisen. One of these is call processing, in which the mailbox functions as a directory or as an automated attendant that greets callers, offers them a menu of options and transfers them to the destination of their choice.

Call processing can also be used in conjunction with other applications, including information mailboxes. For example, information mailboxes are configured as simply "listen only" voice bulletin boards or as "listen and reply" mailboxes, allowing callers to record replies to announcements.

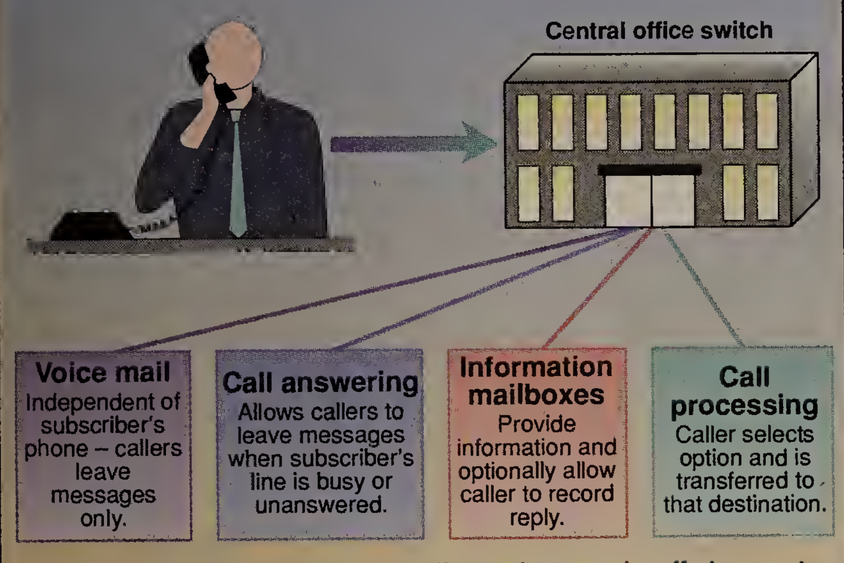
In general, the RBHC network-based voice-messaging offerings are limited to call-answering and voice-messaging capabilities. The interexchange carrier services offer more traditional voice mail-related functionality, with the more sophisticated call processing and information mailbox services being offered only in conjunction with their 800 and 900 product lines. As time passes, these same capabilities are spreading to the general network services, such as virtual network services.

RBHC and interexchange carrier call-answering services are basically enhanced answering machines. When a call terminates at a busy line or is unanswered after a certain number of rings, the carrier automatically routes it to a voice processing unit that plays a greeting and receives the inbound message. When the subscriber picks up the phone at the home or office, a special stutter dial tone indicates that one or more messages are waiting.

Call-answering services generally offer customers the ability to subdivide mailboxes into several guest mailboxes, so one line can support multiple mailboxes.

A small business with four principals could have customers press a certain number to leave a message in one person's box, as opposed to in one general company mailbox.

Carrier-based voice-messaging services


Central office switch
Voice mail
Independent of subscriber's phone – callers leave messages only.
Call answering
Allows callers to leave messages when subscriber's line is busy or unanswered.
Information mailboxes
Provide information and optionally allow caller to record reply.
Call processing
Caller selects option and is transferred to that destination.

Carriers are competing with voice mail manufacturers by offering most of the popular features available on premises-based equipment.

GRAPHIC BY SUSAN SLATER

SOURCE: TELECHOICE, INC., MANCHESTER, CONN.

Voice mail services are similar but more independent than telephone answering services. Callers don't automatically overflow to voice mail when the called person is on the line or when there is no answer. Instead, customers directly enter the mail system by dialing an 800 number or other access number. Therefore, these services are targeted at firms whose employees or customers don't necessarily need to talk directly with an employee.

Public network-based voice mail services sport broad functionality. Among the more advanced features available from RBHC and interexchange carrier voice mail services are:

- **Future delivery.** Users can record a message and schedule it for delivery at a later time, often up to a year in advance.
- **Group lists.** This feature allows users to send the same message to multiple mailboxes simultaneously. Users can typically maintain several group lists at a time.
- **Attendant cut-through.** Outside callers can dial "0" to be routed directly to an attendant or receptionist.
- **Message tagging.** Callers can replay, rerecord or cancel their recorded messages from any push-button phone. They can also tag a message as urgent, which puts it ahead of nonurgent messages in the mailbox. Callers can also send private messages that won't be forwarded to other mailbox holders.
- **Guest mailboxes.** Subscribers can assign a portion of their mailbox to individuals who are not subscribers, but with whom they frequently communicate. Most carriers allow up to three guest mailboxes. Each guest is assigned a password to access the mailbox.
- **Outside notification.** A message notification can be sent to a pager, cellular phone or another telephone when a message is left.
- **System networking.** Voice mail can be forwarded and received from mailboxes outside the central office system. Often, both immediate and batched message delivery is available.
- **Nondelivery notification.** With this feature, the voice mail system reports back to the message sender to say that a message has not been picked up within a designated time period.
- **Specialized reports.** System users generally receive monthly usage reports on nonactive boxes and improper password attempts, as well as information on storage and calling activity.

These stand-alone voice mail services can be combined with PBX or RBHC features such as call forwarding on a busy signal to give them the same functionality as call-answering services.

For the most part, carrier-based voice mail services require use of a push-button keypad. This can limit the services to domestic termination, given the lack of push-button service overseas. The one exception is AT&T VoiceMark, AT&T's message delivery service designed for interconnection in the U.S. and more than 150 countries overseas. The VoiceMark offering may be operator-assisted (see "AT&T delivers with VoiceMark," page 54).

Carriers get started

The interexchange carriers are just beginning to integrate voice-messaging capabilities with their network services. Only two of the top four companies — AT&T and Telecom*USA, Inc. — offer basic voice mail service.

MCI Communications Corp. and US Sprint Communications Co. offer enhanced interactive voice processing through their 800 and 900 number programs, but these are not generally offered as separate products such as voice mail. MCI, which is in the midst of a merger with Telecom*USA, is examining the benefits it will receive from the acquisition of Telecom*USA's voice-messaging products. In addition, US Sprint is looking at expanding its Sprint Gateways voice-processing capabilities to its general network services.

AT&T Voice Mail is a network-based version of office voice mail. It is reached via an 800 number or local access through Chicago, Los Angeles, New York and San Francisco. Other access methods, such as 900 and Software-Defined Network (SDN), are negotiable. AT&T Voice Mail requires a standard one-year contract at a monthly fee of between $8 and $12 per mailbox, with additional charges for usage and AT&T 800 service.

Later this year, AT&T says it expects to link its voice mail service with its Audix premises-based voice mail product to enable users to customize their premises systems with a companywide voice-messaging service. The service can also be integrated into large PBX and Centrex switches.

Telecom*USA offers its voice-messaging services in conjunction with its 800 and travel card services. These services have both call-answering and voice mail functions.

Both the 800 service and travel card voice-messaging services are part of Telecom*USA's interactive calling card system, which also provides integrated conference calling, message storage and transfer, speed dialing, direct connection to specific stations, and a range of news, weather, financial and lifestyle information.

With 800 service, an 800 number terminates into Telecom*USA's voice processing system, which enables the carrier to offer both standard and customized products. Customers can be sent directly into a voice mail system, an options menu or to a live operator. Telecom*USA's travel card network also uses 800 number access. Depending on the authorization code entered, the customer has access to a varied range of functionality.

Interactive applications

Currently, there are few standard interactive voice processing offerings, mostly due to the nature of call processing and information mailbox applications. As defined earlier, interactive voice messaging is an applications-driven, customized service in which the user selects the features and functions required, and the carrier configures the system.

In information delivery applications, callers can dial a special telephone number and select from a collection of stored programs to listen to. In transaction situations, callers can access information in data bases, place orders or perform other transactions through their push-button phones.

The inbound calls are screened by the carrier's network and routed to the nearest voice processing location. Each call is handled there according to a script written by the carrier for that particular application. Typically, all software, digitized speech files and data files are stored and managed by the carrier.

AT&T markets this capability under its InfoWorx interactive response program. As the name implies, InfoWorx allows callers to interact with the network through voice prompts and push-button input. Callers can access information, perform transactions or enter information using the push-button keypad, bypassing the need for live operators.

RBHC voice messaging's questionable future

Voice-messaging services provided by the regional Bell holding companies may be in for a rough time due to a June ruling by the U.S. Court of Appeals in San Francisco to overturn the Federal Communications Commission's 1985 Third Computer Inquiry rules.

Computer III allowed the RBHCs to combine their regulated and unregulated subsidiaries and prompted the Open Network Architecture (ONA) plan. Under ONA, the RBHCs unbundled their network services into individual units that any enhanced service provider could purchase, including the RBHC itself. With voice mail, such ONA components could include call forwarding and call waiting.

Most of the RBHCs offer voice mail as part of their regulated infrastructure. Only Ameritech offers voice mail through a separate unregulated subsidiary (Tigon Corp.).

If the court's decision holds, the RBHCs will be forced to spin off their voice mail entities, which may doom many of the services due to the higher costs of being independent. For now, however, the RBHCs are assessing the impact this decision will have on all their network services.

— Daniel Briere

Significantly, users can access the program through AT&T 800, 900 and SDN services. SDN access is ideal for intracompany programs providing information, transaction services or other functions for companies with multiple small locations.

Sprint Gateways also offers interactive voice processing, in conjunction with US Sprint 800 and 900 service, for US Sprint customers. MCI, working with an outside service bureau, is currently beta-testing an interactive voice processing application for its products.

BOC services take off

More so than the interexchange carriers, the RBHCs have been quite active in launching their own brands of voice-messaging services. Most of the RBHCs either have existing service or are trialing new services for launch in the near future — although these trials may be curtailed by the overturn of the Federal Communications Commission's Third Computer Inquiry (see "RBHC voice messaging's questionable future, this page). These services are detailed in the chart beginning on page 46.

Like the interexchange carriers, the RBHCs offer voice-messaging services with capabilities and features that are fairly equivalent to premises-based equipment. And the RBHC services can be quite sophisticated. Nynex Corp., for instance, offers all four types of voice-messaging services — voice mail, call answering, call processing and information mailboxes. A number of RBHCs, including Ameritech, also are either offering or trialing pay phone-related voice-message forwarding capabilities.

Most of the RBHCs offer voice-messaging services with their local and instate long-distance services. However, Ameritech is taking a fundamentally different approach. None of Ameritech's Bell operating companies offer voice-messaging service through the network; however, up to 17 vendors have been approved for the interconnection of their voice-messaging products and services to the BOC customers' systems.

Checking out pricing

The RBHC services do, however, have distinct pricing differences relative to the interexchange carrier alternatives. Voice messaging is one of the few areas in which the RBHC services compete directly with available interexchange carrier services. Pricing can vary widely, and users

(continued on page 54)

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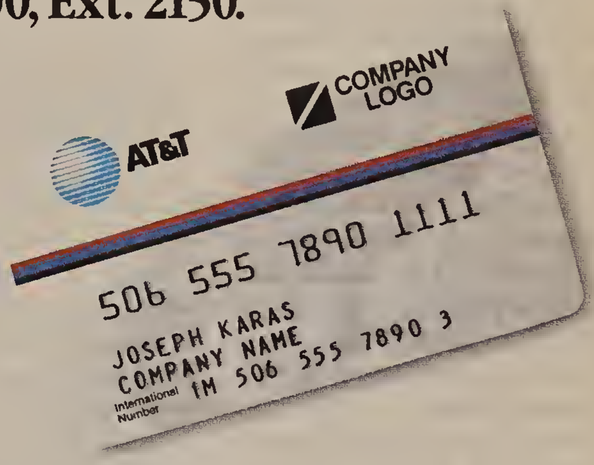

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Voice messaging

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should compare both options.

In general, pricing for RBHC call-answering and voice mail services is on a flat-rate basis — users purchase a specific amount of time or number of messages per month.

A few BOCs, such as Nevada Bell, offer a usage-sensitive option as well. With this format, the user pays a monthly recurring charge plus a fee for each minute of use on the system. Still other BOCs charge a flat rate for voice mail ports and hours of storage, an option geared toward firms with heavy usage.

Few of the interexchange carrier services have flat-rate pricing. Most of their voice mail options include the cost of a mailbox as well as access and usage charges for access from around the nation. The 800 access and usage fees can run up to 30 cents per minute.

In general, the RBHC options, as well as AT&T voice mail, compete against both service bureaus and premises-based options for users. The costs for service bureaus, third-party voice mail services or answering services are fairly consistent with the RBHC and interexchange carrier offerings — from $13 to $18 per mailbox, according to research conducted by Walton and Walton Associates, Inc., a Richmond, Va., communications consulting firm.

The allocated cost for memory storage space for messages runs from 13 to 28 cents per minute. To keep expenses down, many firms limit the amount of system usage any one employee can have. Access costs, such as 800 usage fees, are extra.

Premised-based costs are quite different. A large premises-based system can cost up to $200 per telephone line serviced by the system, plus floor space, service and administrative costs. While this sounds expensive, at these rates, the payback between a premises-based system and a network-based or service bureau option can be quite short — often less than a year — based on purchase price alone.

It's more difficult to evaluate the total cost of a premises-based system, not only because there are monthly costs for the system, but also because of the costs of personnel, allocated time and resources, real estate space and so on. Still, given all these costs, a premises-based system can be justified in less than two years.

There are instances in which the RBHC or interexchange carrier alternative is the best choice for a network-based system. If a company has many locations in a concentrated local area, the RBHC service might provide a more cost-effective, standard solution. However, if the company is geographically dispersed, the opposite is true; in such a case, an interexchange carrier might be a better choice.

Don't forget about hidden costs, too. For instance, while interexchange carrier access and usage costs may seem higher than both the RBHC and premises-based options, realize that they typically include 800 access costs.

The industry will continue to develop at a breakneck pace, with integration being a major motivating factor. For instance, voice-messaging and electronic-messaging technologies are starting to merge.

Current technology allows users to leave voice memos over voice-messaging systems and to transmit electronic messages over electronic mail systems. Interactive networking combining the two — with voice-messaging systems alerting users to E-mail messages and vice versa — is just starting to become available.

But the technology has not yet been introduced that would allow E-mail messages to be verbally read to voice mail listeners or to transcribe voice messages into E-mail transmissions. But it's not unreasonable to expect this development in the near future.

VoiceMark delivers

AT&T's VoiceMark is radically different from the traditional concept of voice mail: It is essentially a message delivery service.

Users dial an 800 number, enter their AT&T Card, MasterCard or Visa billing number, and input the destination's area code and telephone number. They then say their name if they want it included in the message introduction, choose whether to request a reply message and record the message they wish to leave. As with standard calling card calls, if problems occur or if the user is calling from a rotary phone, an attendant will come on the line.

After receiving the message, the called party can record and append a one-minute response. Anytime within 24 hours of sending the message, the caller can dial the AT&T VoiceMark 800 number to check for responses.

AT&T charges $1.75 for automated delivery and $2.50 for person-to-person delivery to all U.S. destinations. With automated delivery, any person or device answering the telephone at the other end receives the message. With person-to-person delivery, the message is directed to a specific person at the other end. For international calls, the prices range from $4.50 to $11.

Overall, VoiceMark is fairly limited and has some drawbacks. Users are limited to a one-minute message, which will automatically be delivered to anyone who answers the telephone, unless person-to-person delivery is requested.

If the called party has an answering machine with an introductory message that is longer than one minute, part of the VoiceMark message will be lost.

Replies to the message are only held for 24 hours. Status of the message delivery is available only for messages delivered in the past 24 hours. Also, AT&T does not guarantee that the service will be error-free.

The one saving grace, however, is that if AT&T determines that the message is recorded or delivered incorrectly, the carrier will not charge the caller for the message.

— Daniel Briere

Installing a voice system

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cutovers at new company locations.

■ **Test the waters.** For decades, large companies have used test marketing as an efficient, cost-effective method of predicting the success of new products and services. It also works for voice processing applications, especially with audiotex or interactive voice response. The more complex the application, the greater the need for test marketing.

Don't assume that callers will easily weave their way through complex voice menus or that an elaborate interactive voice response application can be designed and put into production without a flaw.

■ **Step-by-step.** Automated attendant service, voice mail and call answering are typically installed as a package. Other features and applications should be implemented later.

Make certain that the system is working as it should, that calls are being answered and processed correctly, and that the wave of user questions and pleas for help have subsided. Once you are sure that all is well with the basic functions, begin to plan your other applications, such as the automated help line for service or the order-entry service for dealers.

■ **Securing the fort.** Criminals have successfully hacked their way into voice processing systems, hijacking voice mailboxes and using them as message centers to sell drugs, stolen credit cards and other contraband. There are steps you can take to prevent this from happening to your system.

First, make sure every mailbox that is activated has a password. Second, insist that passwords are at least six digits long. And third, ask that users change their passwords at least four times a year. The voice processing system administrator should check for unusual activity in voice mailboxes that should not be active and randomly check personal greetings to spot peculiar messages that don't belong there.

■ **Stay in shape.** A voice processing system administrator's job is never done. Daily routines must be scheduled to insure the smooth, continued operation of your system. Most systems produce useful reports that pinpoint employees who have not used their mailboxes, or others who fail to erase old messages and consume expensive memory needlessly. Administrators can also check for users that may not have recorded personal greetings, indicating the need for remedial training.

R.J. Reynolds' Videtich adds that administrators should be on the lookout for endless loops in which callers are continually forwarded to unanswered mailboxes, with little hope of ever talking to a live person.

IBM, 3Com work to ease mgmt.

continued from page 1

including nodes on Ethernet and Token-Ring LANS — users who want to implement CMIP on LANs will find its memory requirements prohibitive.

"Our position is that a lot of LAN-attached devices, such as DOS workstations, printers and servers, don't have the memory capacity to support the full seven-layer OSI network management stack," said Rick Thomas, a programmer in the LAN network management group at IBM's facility in Research Triangle Park, N.C.

Another reason for the creation of HLM is that LAN users cannot wait for the official standards bodies to complete the CMIP standard and, in any case, do not need all of it to solve their immediate network management problems.

"The LAN arena is growing much faster than the rest of the marketplace and can't wait a year for a standards committee to investigate something," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

"IBM and 3Com have promised to come up with a document by the end of the year that people can use to start developing actual products," he said.

The two companies emphasized the urgency of the situation by pointing to studies that indicate there are a growing number of internetworked Token-Ring and Ethernet LANs.

CMIP is being designed to manage such environments but requires that the full seven-layer CMIP stack run in each managed device on the network. While this is no problem for minicomputers and mainframes, it taxes the limited resources of personal computers.

To shrink down the standard, IBM and 3Com are defining a subset of CMIP that will address just the bottom two of OSI's seven layers. While full CMIP network management software will have to implement the entire seven-layer stack and run at the application layer, products based on HLM will run on the Logical Link Control (LLC) sublayer of the OSI data link layer.

Consequently, the HLM subset will take up only about one-tenth of the 400K bytes of memory required by the full CMIP stack, and it will fit in DOS-based personal computers and related devices typically found on LANs.

HLM is independent of network and workstation operating systems, and can ultimately be extended to cover other network types such as Fiber Distributed Data Interface and LocalTalk, in addition to Token-Ring and Ethernet.

To implement CMIP over LLC in the initial HLM specification, IBM and 3Com, in cooperation with Microsoft Corp., are building extensions to the 3Com/Microsoft Network Driver Interface Specification (NDIS). NDIS, a universal device driver for connecting network operating systems to different makes of LAN interfaces, was adopted by IBM last year.

However, similar extensions accommodating HLM could be added to competing universal interface specifications, including the Open Data Link Interface backed by Apple Computer, Inc. and Novell, Inc.

IBM and 3Com plan to have HLM completed and submitted to such industry organizations as the Institute of Electrical and Electronics Engineers, Inc. and the OSI Network Management Forum for review by the end of this year.

Industry experts applauded the concept but said real products based on HLM are probably at least a couple years off.

"The fourth quarter [of this year] might be a bit optimistic for completing a specification that incorporates industry feedback," said Mary McCaffery, a vice-president at brokerage C.J. Lawrence, Morgan Grenfell, Inc. in New York. "But there is a legitimate need for what IBM and 3Com are trying to do, and it is important to have companies with their stature assume this kind of leadership."

Network World *Senior Editor Laura DiDio contributed to this article.*

FCC takes action to lower rates

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The accounting rate is the amount of money that a U.S. carrier pays a foreign carrier to terminate a call. Carriers tack on an additional amount, which represents a profit for them, and the total charge is referred to as the collection rate. This means that unless U.S. carriers are willing to accept lower profit levels, they are limited in the amount they can lower costs for U.S. customers, since the accounting rate is a fixed part of a call's cost.

Not only has the current accounting rate structure kept prices for U.S. callers artificially high, it has created a lopsided outflow of money from the U.S. to foreign countries. In 1988, the most recent year for which the FCC has figures, the U.S. had a $2 billion deficit for telecommunications services.

The reason for the deficit is that U.S. outbound calls represent about 66% of all international traffic. So U.S. carriers pay far more to foreign countries to terminate calls than those countries pay to the U.S. The FCC hopes lowering accounting rates will stimulate more calls to the U.S. from foreign countries and thereby whittle away at the deficit.

FCC officials insist, however, that the agency is not embarking on "a Lone Ranger" effort that could impact trade in other business areas. Sikes said the FCC has informed other governmental departments, such as the International Trade Representative, the Department of State and the Department of Commerce.

The U.S. is not the only nation with a deficit in telecommunications services, so there is increasing interest worldwide to work out a more equitable accounting rate structure, Sikes said. Specifically, he said, the European Commission and the U.K.'s Office of Telecommunications are also exploring the international rates issue.

DEC adds net control tools

continued from page 2

comes bundled with a set of DEC's existing net management tools, which will eventually be replaced by DECmcc Director. It is intended to be an entry-level platform for DECmcc Director. Users with larger networks will likely run DECmcc Director on more powerful VAXes and use attached DECmcc Management Stations as management consoles.

Also last week, DEC said Microsoft Corp. and several other vendors are building EMA-compliant software that will enable DECmcc Director users to manage their products (see "8 more vendors pledge DECmcc Director support," this page). Microsoft will build software enabling DECmcc Director to administer local-area networks based on its LAN Manager network operating system.

DEC also discussed plans to provide EMA products that run under Ultrix, DEC's version of Unix, and introduced DEC Extended LAN Management Software (DECelms), which will manage DEC's Fiber Distributed Data Interface products announced at DECworld (see "DEC rolls out FDDI wares, holds off on token ring," page 2). DECelms, which replaces DEC's Remote Bridge Management Software package, will also manage existing DEC LANbridges.

Analysts said the announcements show that DEC is close to providing the integrated net management capabilities competitors like IBM and AT&T are already delivering.

"It's a very positive announcement for DEC, especially when they reach Version 1.1 and actually have a fully blown system," said Steve Wendler, program director at Gartner Group, Inc., a Stamford, Conn.-based consulting firm.

As EMA's core element, DECmcc Director includes a DEC data base management system and an Executive Module that manages the flow of data between modules performing specific net management tasks.

For instance, the Executive Module routes data between Access Modules that collect management information from hardware and software on the network and Functional Modules that process that data. The Executive Modules also route data among Presentation Modules, which define how information is displayed to end users.

DECmcc Director is supplied in two packages: a Starter Kit that comes free with each DECnet/VAX license, and an $11,780 Basic Management System (BMS) that supports added functionality. The media and documentation for the Starter Kit cost $1,500, but the software is free.

Some users at DECworld wanted to see more progress in rolling out the products.

▲▲▲

Version 1.0 of the Starter Kit includes the DBMS, and the Executive and two Access Modules — one that collects management data from DECnet Phase IV devices using DEC's Network Information Control and Exchange (NICE) protocol and another that collects data from DECnet Phase V devices using DEC's implementation of the Open Systems Interconnection Common Management Information Protocol.

Version 1.0 also includes a Presentation Module supporting a command line interface and two Functional Modules — one that enables users to set up data bases containing information about network devices and one that instructs Access Modules to collect management data at specific intervals.

Version 1.0 of the BMS includes Access Modules that collect Ethernet, LANbridge and FDDI performance data. It also includes Functional Modules that enable users to set performance thresholds for net devices, determine when thresholds have been exceeded and generate either alarms displayed to users or commands to rectify the problem.

Version 1.1 adds a Functional Module to the Starter Kit that enables users to assign management of specific devices or geographical areas of the network to specific network operators. It also includes a Presentation Module supporting a graphical user interface, which displays devices as icons on a network map.

Version 1.1 of BMS includes Functional Modules that enable users to store historical performance data, analyze that data and automatically receive alarms generated by network devices. Version 1.0 can only poll devices at certain intervals to see if an alarm condition exists.

DEC also introduced two Optional Modules. An Access Module that uses the Simple Network Management Protocol to collect management data from devices on Transmission Control Protocol/Internet Protocol-based networks will be available in February 1991 for $5,890. An expert system-based Functional Module called DECnet Diagnosis that helps users troubleshoot DECnet problems will ship next February. Users that buy a DECmcc Management Station before November 1991 get DECnet Diagnosis for free while others pay $11,780.

DEC said it is including the DECmcc Director Starter Kit, BMS packages, DECnet Diagnosis and DECelms software, in Version 2.0 of its DECmcc Site and Enterprise Management Stations, which will ship in November.

The new DECmcc Site Management Station, which manages local DECnets, costs $26,505, while the new DECmcc Enterprise Management Station, which manages both local and wide-area DECnets, costs $44,175. Current users get the upgrade for free.

On the Ultrix front, DEC said the Ultrix version of DECmcc Director will ship by the end of 1991. In addition to supporting the same features as the VMS version, it will enable users to manage devices on a TCP/IP net using SNMP.

DEC also introduced an Ultrix-based DECmcc Management Station that enables customers to manage SNMP-based devices while the Ultrix version of DECmcc Director is being developed. The product includes a DECstation or VAXstation 3100 running DEC's first SNMP-based management tool. It also runs a set of formerly stand-alone tools that manage devices on DECnet Phase IV networks using NICE and comes with a DECwindows-based graphical user interface.

Scheduled to be available in November, the DECmcc Management Station for Ultrix will cost $14,136. Users that purchase the product now will receive an upgrade to the Ultrix-based DECmcc Director when it becomes available.

Some users at DECworld were impressed with DEC's management architecture but wanted to see more progress in rolling out the products.

"They've defined an architecture that makes sense," said John Blevins, data communications manager for Hallmark Cards, Inc. in Kansas City, Mo. "But what I want is not there in the first release."

Blevins wants a management system capable of managing DECnet as well as the many DOS-based microcomputers and Apple Computer, Inc. Macintoshes he is connecting to Ethernets. Although Microsoft and Apple announced they will develop Access Modules for DECmcc Director, Blevins wishes those products were available now. "I guess I'm just a typical impatient user," he said.

Louis Hills, a Raytheon Co. information systems manager, said he is also looking for more functionality in DECmcc Director. Hills needs to manage a large nationwide backbone network that supports DECnet, IBM Systems Network Architecture and some 30 other protocols.

"I'm personally very impressed," Hills said. While the integrated management system Raytheon chooses must have good DECnet management capabilities, it must be able to manage third-party devices as well, he said. "And DEC is committed to the direction that we want to go in."

8 more vendors pledge DECmcc Director support

BOSTON — Digital Equipment Corp. drew more third-party support for its DEC Management Control Center (DECmcc) Director software, the core of its Enterprise Management Architecture (EMA), at DECworld '90 here last week.

Eight more vendors joined DEC's EMA Strategic Vendor Program, bringing the number of EMA partners to 21.

Five vendors — Apple Computer, Inc., Ascom AG of Switzerland, Distributed Technologies Corp., InterConnections, Inc. and Microsoft Corp. — will develop Access Modules that link their products to the VMS-based DECmcc Director.

Apple will build an Access Module that lets DECmcc Director manage AppleTalk nets, while Ascom's module will manage its packet-switching equipment. Distributed Technologies' module links its TalkManage product, which supports configuration management and capacity planning for AppleTalk nets, to DECmcc Director.

InterConnections and Microsoft will jointly develop an Access Module to let DECmcc Director handle administrative tasks for Microsoft LAN Manger-based local-area nets. Two other vendors — Proteon, Inc. and Wellfleet Communications, Inc. — will build software enabling DEC's Ultrix-based DECmcc Management Station to manage their products using the Simple Network Management Protocol (SNMP).

Introduced last week, DECmcc Management Station for Ultrix is a DECstation or VAXstation 3100 running software that manages SNMP devices and DECnet Phase IV devices supporting DEC's Network Information Control and Exchange protocol.

BBN Communications Corp. licensed the full VMS-based DECmcc Director and will use the software to develop a package that can manage its line of packet-switching equipment.

DEC will ship an $8,835 DECmcc Director Developer's Kit in November, which other third-party vendors and customers can use to build their own Access Modules. Four existing EMA partners — Codex Corp., StrataCom, Inc., TSB International, Inc. and Vitalink Communications Corp. — demonstrated Access Modules that let DECmcc Director manage their equipment.

Chipcom Corp., another EMA partner, built software into its Ethermodem III Bridge that works with a DEC-developed Access Module for bridge management.

— *Jim Brown*

Travelers may break with IBM

continued from page 1

"What we want to keep away from is separate networks," said Robin Layland, engineering consultant in network engineering and telecommunications for Travelers.

The insurance giant's current SNA network, supported by a T-1 backbone that also supports voice, connects more than 200 sites.

The company has data centers in Hartford and Norcross, Ga., that house 10-plus IBM 3090 mainframes and 18 IBM Model 37X5 front-end processors. Eight regional offices with IBM 37X5 front ends serve as concentration points for data traffic from field offices nationwide. The 37X5s are linked to the data centers at speeds of 56K and 128K bit/sec.

Field offices are equipped with IBM 3X74 terminal controllers, which are linked to the 37X5 concentrators over leased lines at speeds ranging from 9.6K to 56K bit/sec, and IBM Token-Ring LANs, which are tied into the regional 37X5s via gateways at speeds up to 19.2K bit/sec.

> "What we want to keep away from is separate networks," Layland said.
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The company's Hartford campus and data centers in that city and Norcross are linked in a triangular configuration via Synchronous Data Link Control and parallel links supported by IBM source-routing bridges. Those bridges, which support only a small amount of the company's data, are a precursor to the potential migration to a multiprotocol LAN internetwork backbone.

The LAN internet

Layland said the company first began exploring the use of a LAN internetwork as an alternative to its corporate SNA backbone because it wanted the flexibility to support additional protocols on the network.

With the current architecture, if the company wanted to add Network Basic I/O System or Transmission Control Protocol/Internet Protocol devices to a field office LAN, it would need to install a gateway for each protocol, Layland explained. Each gateway would also require a separate wide-area data link to the nearest remote 37X5.

Migrating the backbone to a LAN internetwork based on bridge/routers would enable Travelers to support virtually any protocol without adding hardware and would eliminate the leased lines required for each gateway. With bridge/routers, terminal controllers in remote offices could be linked to the token-ring LANs and share a wide-area data link to a token ring in the nearest regional office.

In addition to SNA traffic generated by the 3X74, this type of configuration would make it possible to support multiple protocols, including TCP/IP, Novell, Inc.'s Internetwork Packet Exchange (IPX) and Xerox Corp.'s Xerox Network Systems.

The token rings in the regional offices would support local personal computers as well as a 37X5 outfitted with a token-ring interface card.

From the regional office, SNA and LAN data would be passed on to bridge/routers or token rings supporting front-end processors in the data centers.

Bridge limitations

Although the company sees benefits in such a backbone, it is not satisfied with the performance of the IBM bridges it now has because the source routing they use creates overhead problems in mesh networks ("User mulls options due to problem with IBM bridges," *NW,* July 9).

Regional data centers would more likely use routers, which have greater intelligence and, therefore, could support the multiple paths that would be required to connect a single regional office to both data centers.

Travelers said it is also concerned about the reliability of the

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IBM bridges, which are based on IBM Personal System/2s or Personal Computer ATs and use a hard disk. "We know from our own experience that those parts can fail," Layland said. "We would prefer those bridges to be burned-in electronics, which is the quality of most communications equipment, like muxes and 3745s."

In exploring alternatives to the IBM source-routing bridge, Travelers has found that cisco Systems, Inc.'s routers support multiple protocols including TCP/IP, IPX and XNS, and they encapsulate SNA data in TCP/IP format, a technique the vendor said minimizes source-routing overhead.

But Travelers said it wants to explore capabilities offered by other vendors and is, therefore, proceeding slowly. "Other firms are just getting into token ring this year, so the technology is just now emerging," Layland said.

Another issue that is being examined is bandwidth requirements. The multiprotocol backbone may require higher capacity interoffice links than the SNA net. "We don't know yet how bursty the token-ring traffic will be," Layland said, "but everybody has convinced me it's more bursty than SNA."

A related issue is whether response time delays will be introduced by the need to traverse two sets of bridge/routers when going from a field office through a regional office to the data center.

However, Layland said, "We don't see any reason why the bridge/routers should add significantly to the response time because all the vendors talk about how fast they are."

If the firm goes ahead with its plans, Travelers will initially run a multiprotocol LAN internetwork in parallel with the SNA net.

As it stands, it is highly likely Travelers will begin implementing the new LAN internetwork in the next year or two, "unless we find it has problems no one's imagined," Layland said.

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TECHNOLOGY THE WORLD CALLS ON

GTE/Contel merge

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"This merger will provide the critical mass and financial strength Contel has sought in order to accelerate" its various telecommunications initiatives, said Contel Chairman Charles Wohlstetter, who would become a vice-chairman at the new company.

Analysts said the move would help the companies compete more effectively in the emerging world market.

"This is a 'scale move' driven by several factors, including the need for size to compete in the increasingly global telecommunications industry," said Harvey L. Poppel, a partner at Broadview Associates, a Fort Lee, N.J.-based information technology merger and acquisition firm. "It was also driven by the company's nontelephone businesses — information systems [systems integration and information services] and satellite services — neither of which marshaled major positions individually, but together are much stronger."

Analysts said the merger is likely to have little impact on users, at least in the short term.

"In time, we'll see the consolidation of contiguous telephone operations of GTE and Contel, and that's where users might see some cost savings," said Steve Sazegari, senior industry analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm. GTE and Contel may choose to consolidate nearby administrative operations and physical plants where feasible, he said.

Under the proposed merger agreement, GTE will issue 1.27 shares of its common stock for each Contel common share, for a total of about 200 million GTE shares. The merger is subject to approval by the directors and stockholders of both companies, as well as various regulatory agencies.

The companies expect to sign a definitive merger agreement within a few weeks and estimate the deal will be completed in six to eight months.

Some analysts said GTE got a bargain by paying roughly $40 per Contel share. Contel is the nation's third largest independent local telephone company behind market leaders GTE and United Telecommunications, Inc., and its stock was valued at as much as

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Keys to success in outsourcing

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and that's something that doesn't get penned into a contract," said Stanley Welland, manager of corporate telecommunications at General Electric Co. in Fairfield, Conn.

Laying the groundwork

According to Allan Froehlich, senior manager of Nolan, Nortan & Co., a Chicago-based management consulting firm, an outsourcing contract must embody performance standards that reflect the user's underlying objectives for outsourcing.

Contracts should stipulate requirements for network uptime, reliability and route diversity. They should also set certain service levels, including meantime for repair, help desk staffing and escalation procedures for notifying higher levels of vendor management when problems persist.

The agreements should also specify policies and procedures regarding technology upgrades, change management and project planning. American Standard, Inc., for example, stipulated that its two outsourcing vendors could not fall two releases behind in upgrading data center software or implement a new operating system without its agreement.

Managers also said it is important to settle on the methods that will be used to measure how well vendors are meeting peformance standards. Some typical measurements include bit error rates or system and net availability.

Perhaps most important, contracts should also contain guarantees that vendors will deliver the cost savings or other benefits they promised with outsourcing.

"If vendors say they are going to save you $10 million and reduce your head count, then have them back it up in writing," said Thomas Byrnes, vice-president and group manager of telecommunications at Merrill Lynch & Co., Inc. "This forces them to give realistic estimates. If they fall short, they should agree to compensate the difference."

But Byrnes said users must first audit their own operations to determine exact costs for services and overhead. This establishes a baseline figure with which to evaluate vendor bids and performance after the contract is signed.

"To make sure you know what you're getting, you need to know exactly what you have and what it costs you," Byrnes said.

Managers said contracts should provide an escape clause that allows the user to migrate operations to an alternative provider should the vendor fail to meet performance or other contract stipulations. Since it is difficult to rebuild in-house systems or network staff from scratch, it's imperative that users don't outsource anything that can't be taken over by another vendor.

Finally, managers said users should consider the effect outsourcing will have on in-house personnel ("Farming out net operations can trigger staffing issues," *NW*, Jan. 15).

To avoid a crisis of morale or wholesale resignations, companies should tell employees immediately after announcing an outsourcing decision who will be laid off or transferred to the vendor, whether pensions will be assumed by the vendor and what rank employees will hold in the vendor organization. These issues should also be arranged in the contract with the vendor.

Outsourcing contracts should be short and simple, said Herbert Chaplin, vice-president of information systems for Ultramar, Inc., an oil refining and marketing company in Long Beach, Calif. Chaplin's contract with Power Computing Co., which manages the company's IS operations and data network, is 20 pages in length.

The contract defines the expectations of both parties, confidentiality of Ultramar's data, security issues and disaster recovery.

Pricing, equipment configurations, service levels and performance standards are discussed in an addenda so they can be easily changed at a later date.

Roy Carlson, vice-president of management services at Southern Pacific Transportation Co. in San Francisco, stressed the importance of using consultants to facilitate negotiations. Southern Pacific used Ernst & Young to draw up its request for proposal, provide a short list of appropriate vendors to bid on the deal, act as intermediaries to vendors and help evaluate the bids.

While negotiating an outsourcing contract can be complicated and time-consuming, managers agreed that once the contract is signed, they don't expect to look at it again.

"If you have to rely on a contract to govern the vendor relationship, you are going to have problems," said GE's Welland.

Welland said he talks constantly — even on weekends and at night — with vendor representatives assigned to his account. Vendor representatives even have voice mailboxes at GE to facilitate communications.

Besides impromptu communications, most net managers said it is imperative for users and vendors to hold regular meetings.

The Dial Corp., a manufacturer of personal, cleansing and food products that recently outsourced its data center operations and voice and data network to Andersen Consulting, has a joint oversight committee that meets quarterly to review vendor performance and address any problems that need resolution.

This committee is composed of senior executives from Dial and Andersen, as well as an end-user representative from Dial.

"Having a user on the committee is key," said Bill Tekien, director of IS at Dial. "No matter what the statistics show, it's the users' perception of the quality of service that determines whether the vendor is succeeding."

In addition, systems and net managers from both organizations meet monthly to review the status of operations and to discuss changes in equipment and system or net design, Tekien said.

Criteria for selecting an outsourcing vendor

According to Gartner Group, Inc., a Stamford, Conn.-based market research firm, managers who are considering outsourcing their network operations should evaluate vendors in five areas and ask some basic questions:

- **Account management.** Can the vendor provide uncomplicated and unbundled prices for distinct services? Can the vendor provide separate bills for network expenses incurred by individual business units?
- **Configuration management.** Can the vendor adapt to your firm's changing business needs and execute network changes rapidly? How long will it take the vendor to perform moves and changes after a request is made?
- **Fault management.** What technology platform does the supplier use, and is it standards-based? Will the vendor provide equal or better service than in-house staff? Will the vendor agree to pay penalties if it fails to achieve mutually agreed performance levels?
- **Performance management.** Can the vendor provide detailed reports on network availability, response time and security breaches, as well as network outages, including time of outage, cause and duration?
- **Security management.** What hardware and software does the vendor use, and is it reliable?
- **Other.** What are the vendor's problem escalation policies with carriers? Will the vendor obtain credits from carriers for outages?

— *Wayne Eckerson*

How-to guide for negotiating

Thomas Byrnes, vice-president and group manager of telecommunications at Merrill Lynch & Co., Inc. in New York, offers these five tips for negotiating outsourcing deals:

- Keep the bidding process competitive. Deciding on a vendor too early in the process reduces your chances of obtaining the most favorable terms.
- Know when to negotiate prices. Do not discuss prices until you have established performance criteria and determined your baseline costs.
- Educate vendors about your business and requirements. Despite what vendors say, only you know your business best.
- Know when to close a deal. Do not belabor negotiations when the benefits of closing a deal outweigh benefits of further negotiations.
- Treat all vendors with respect and courtesy. You will have to work closely with one of them for many years.

— *Wayne Eckerson*

GTE/Contel merge

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twice that by some analysts. This has raised speculation that another company, such as an RBHC, could post a competing bid for Contel before the deal with GTE is finalized.

Analysts applauded the move because it increases GTE's and Contel's local telephone and cellular business penetration.

"They've surprised the industry," Sazegari said. "I thought GTE would try to expand but by buying a few smaller companies."

The deal has spurred speculation that other telephone companies will be acquired and as a result set off a rally on Wall Street in the stocks of other independent local telephone company stock prices.

Executives of GTE and Contel cited several areas in which the companies are closely aligned. In addition to their local exchange and cellular telephone operations, both have units that specialize in selling telecommunications systems and services to the government, and both have information services offerings.

"As they begin to harness their new scale and scope, GTE and Contel could be much more substantial factors in the information services and systems integration markets," Broadview Associates' Poppel said.

Both firms are in the VSAT satellite network business as well as their GTE Spacenet and Contel ASC operations.

"The satellite businesses are a good fit," said Ben Occhiogrosso, vice-president at DVI Communications, Inc., a New York-based consultancy. "GTE brings the space segment capabilities to the table, while Contel brings the earth stations," he added.

Coincidentally, both companies have also undergone recent corporate restructuring programs to cut costs and streamline decision making.

"[This is] a perfect combination," said James Johnson, chairman and chief executive officer at GTE. Johnson would retain those roles following the merger.

Spokesmen for both companies said it is too early to determine how the companies will consolidate their telecommunications operations.

GTE subsidiaries operate in 46 states and 41 countries, with combined revenue of $17.4 billion and net income of $1.4 billion in 1989. GTE's core businesses, in addition to telecommunications, include precision materials and lighting.

Contel, based in Atlanta, serves 2.6 million access lines in 30 states. It operates cellular systems in 36 metropolitan areas, through Contel Cellular, Inc., a subsidiary of which it claims 90% ownership. Contel's 1989 revenue was $3.1 billion, with net income of $277 million.

The merger will not have much impact on the RBHCs' local exchange businesses since neither GTE nor Contel operate in territory served by the RBHCs, said Jim Stork, vice-president and analyst at Duff & Phelps Selected Utilities, Inc., a Chicago-based investment firm.

"But the combined GTE/Contel company could present a challenge to the RBHCs in the cellular arena," Stork said.

The merger could even backfire on GTE and Contel, Sazegari said. The RBHCs could complain to state regulators that the bigger GTE should be more strictly regulated. Currently, GTE and Contel are less visible to regulators than are the RBHCs, he said.

The RBHCs could also use the merger as ammunition in their fight to be freed from restrictions preventing them from offering information services content, analysts said. Neither GTE nor Contel have such restrictions.

Unforeseen problems that can put the bite on your network

Battling the telecom gremlins

By BRUCE HOARD

I am, I admit, a telecommunications user of modest means — a plain old telephone service type of guy. I work out of my house with one line for home and business. I've got an answering machine and a 2,400 bit/sec modem. We're not talking Tariff 12 material here.

About a year ago, I was beset by both local and long-distance gremlins, although I strongly suspected problems with one were behind the problems with the other. Let's dissect the situation in an orderly fashion by addressing both areas.

A while back, during the equal access craze, I received a package from my local telephone company, New England Telephone and Telegraph Co., with information about equal access and how I should be part of it by filling out a ballot indicating my choice of a long-haul carrier. Included was a list of the toll-free telephone numbers for all the competing carriers and a scorecard to write down comparative costs of long-distance calls.

This looked like fun, so I called all the carriers and asked how much it would cost to call from my residence in Ashland, Mass., to the home of my good friend in Vancouver, Wash. All the happy-voiced long-distance service representatives eagerly answered my question.

The decisive winner was ACC Corp., a little-known company based in Rochester, N.Y.

Let me tell you a bit about the sound quality of ACC lines last summer. Over a typical transcontinental connection, you could easily hear an army tank drop — if it exploded on impact. Actually, it worked in my favor because my friend, who is a US Sprint Communications Co. user, frequently got irritated and called me back on his nickel.

Problems surface

Not long after I signed on with ACC, I began encountering sustained periods during busy calling hours when my dial tone would go to fast busy whenever I tried to call outside Massachusetts. The only solution to this problem was to dial "10288" to access AT&T, the carrier from which equal access was created to free me — a cumbersome process at best.

When I called ACC about the problem, they said, in effect, "It ain't our fault; sounds like you don't have equal access."

Buoyed by that piercing diagnosis, I called New England Telephone and asked for "repair." Repair is in Andover, Mass., just up Interstate 495 about 50 miles. I explained the problem to them. We talked about lofty things like points of presence and central office switches. I even found out that Ashland was using an old crossbar switch in its central office. Despite this, New England Tel didn't think my problem was their problem.

Shortly thereafter, my problem with the fast busy signal disappeared as mysteriously as it had appeared. However, a more serious problem soon replaced it. Now, when I tried to dial long distance, I was treated to a horrible three-tone shrieking sound followed by a very scratchy recording saying, "We're sorry; your call did not go through. Will you please try your call again."

Once again, I got on the horn to New England Telephone's repair department. I told Angelo, my customer service representative, about my long-distance problem and a new problem I was now having with my local service: On a great many of the local calls I placed, an operator was picking up after I dialed and asking for my number. It seems the automatic number identification (ANI) portion of the aging crossbar switch in my local central office was on its last leg. That was the bad news. The good news was that New England Tel was replacing it with an AT&T 5ESS switch, with cutover scheduled for that fall.

I went on to tell Angelo that after I dialed locally or long distance, my line frequently either reverted back to dial tone or went blank. No sound, nothing. Angelo listened sympathetically and promised to work on the problems.

Angelo was as good as his word, and within a couple of days, I was dialing long distance again with abandon. Eventually, the ANI inquiries stopped.

It's b-a-a-a-ck

Everything was fine for about three months. Then, suddenly, the shrieking multitonal message monster returned. I immediately rang repair in Andover via the operator and said, "Hi guys, it's happening again."

"Not our problem," they claimed, pointing the fickle finger of fault at ACC.

I doubted them but called ACC anyway. Beverly, my service representative, listened politely to my description of the situation and said, "It sounds like you're getting blocked at the central office." I told her New England Tel said it wasn't their problem. She said she'd get a trouble ticket going and report back.

At this point, I was frustrated and tired of trying to be my own Bell. I rang Angelo and told him the problem was back and that ACC claimed New England Tel was at fault.

Angelo wasn't having it. Even though I was having the same problem I had before and even though it was New England Tel's fault before and even though all the evidence pointed toward some central office snafu, he said, "No." Friendly, but firm. He did, however, offer to make a few test calls with ACC. I asked him to call them, but he refused. Great, so now I had become the official New England Tel/ACC service liaison.

I called ACC back with the test offer. Beverly was at lunch, but Linda said she didn't think the ACC repair people would go for it. I understood. I was getting real good at understanding.

And so it went. Back and forth. ACC and New England Tel. To test or not to test. Finally, Angelo called me back. He sounded a little sheepish. Yeah, well, he said, it was a little software bug after all, but they got it.

That put me right back in the Great American Network, and what a happy guy I was. Dialing free, oh Lord, dialing free at last. For a while. Then the fast busy tone came back when I dialed long distance. I immediately picked up the phone, dialed Angelo's number directly — and got nothing. No dial tone, no ringing at Angelo's end of the line.

Not wanting any more of this, I unfairly dumped ACC — which was definitely the fall guy in this situation — and signed on with US Sprint. About the same time that happened, the 5ESS switch was finally installed, and now I've even got call waiting. A veritable cornucopia of communications is now at my very electronic doorstep. And to think, it only took about six months of misery.

I'd like to pass along some advice that may save other small businesses from the local and long-distance runaround: Always remember that the god of telecommunications is vengeful, arbitrary and, worse yet, totally unregulated. His wrath may be waiting in an adjunct processor near you. You just never know. ◼

Hoard was the founding editor of Network World *and is currently the editor of* CAD/CIM Alert, *a monthly newsletter for users of computer-aided design and computer-integrated manufacturing systems.*

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